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BRITISH MEDICAL JOURNAL

LONDON SATURDAY JANUARY 16 1943

ABDOMINAL WOUNDS IN WAR: TREATMENT OF INDIVIDUAL LESIONS*

BY

Sir JAMES WALTON, K.C.V.O., M.S., F.R.C.S.

Surgeon to the London Hospital

The wound of entry caused by a rifle bullet usually has a small more or less circular appearance. If inflicted at very short range, as in accidental or suicidal lesions, there may be much bruising and local trauma and a relatively large wound of exit. In such cases the blow of impact is very considerable and there is much shock. At an intermediate range there is less local trauma, but the patient is knocked out and brought to a complete stop at the time of wounding. Shock and collapse are still considerable, and are probably increased by internal haemorrhage. There is usually severe pain. At a long range the impact is much less, and it occasionally happens that in the excitement of the engagement the man may not even know that he has been injured. The velocity of the missile may be so diminished that there is no wound of exit, and in some cases it fails to enter the abdominal cavity but travels for a certain distance in the layers of the abdominal wall. In such cases the wound is relatively clean and sepsis is almost entirely dependent upon the presence of visceral injury. In the last two varieties any visceral wounds consist of small clean punctures which are more amenable to simple suture.

Lacerated and Bayonet Wounds

Injuries caused by fragments of H.E. shell are nearly always more disruptive, so that even a small fragment which makes a clean small wound of entry causes considerable laceration of the underlying muscle and irregular tears of the viscera. Such small fragments have a very high initial velocity, which, however, is soon lost against the resistance of the tissues, so that the fragment may not traverse the body but remains embedded within it. Larger masses having a much higher momentum will probably pass through the body and not only cause wide destruction of the viscera but form large jagged wounds of exit. All such fragments, being irregular, are much more prone to carry in pieces of clothing and sometimes even metallic and other bodies which have been present in the pockets. They are therefore, if not treated early, practically always followed by severe sepsis even if the gastro-intestinal tract is not injured.

Large lacerated wounds may occur from glancing blows by irregular missiles. Direct blows of this nature cause so much local injury and collapse that survival is as a rule short. Such lacerations may involve considerable destruction of the abdominal wall, either of all layers—in which case there is much prolapse with perhaps injury of the intestines—or of the cutaneous and muscular tissues only. In this and in past wars remarkable cases have been recorded of extensive prolapse of the intestines, in some of which the patient, supporting his intestines in his hand, has walked to aid and yet recovery has taken place. A satisfactory result will naturally depend upon the time at which treatment can be given. If seen at an aid post situated at a considerable distance from a hospital or mobile team, the intestines should be washed and replaced, the wound dusted with sulphanilamide, a few stitches inserted, and the patient sent on to hospital. If surgical attention can be given very soon, a dressing should be applied and operation undertaken at the earliest opportunity. Under general anaesthesia the intestines should be wrapped in a sterile towel wrung out in saline, and the wound cleaned in the usual way, with excision of all dead and severely lacerated tissues. The intestine is then carefully examined and, if uninjured, freely washed in saline and replaced. The peritoneum is sutured completely or closed so far as is possible. If the muscle has been much injured the cavity is dusted with sulphanilamide and the wound lightly packed with paraffin gauze. Antitetanic and anti-gas-gangrene sera should be administered. If recovery takes place there is of course considerable risk of subsequent obstruction from intestinal adhesions, and a large ventral hernia is almost certain to occur.

Bayonet wounds differ but little from stab wounds seen in civilian life, although, being incurred in the full fury of a charge and with all the strength of a powerful man, they are severe in character and have a very high mortality rate. Solid and hollow viscera are almost certain to be cut. There is severe shock and rapid collapse from the severity of the haemorrhage. If the patient is in a sufficiently good condition to stand operation this will be performed at the earliest opportunity and will follow the general lines, the chief attention being given to suture of the internal injuries and less to the cleansing of the superficial wound, which, being clean-cut, is less prone to become infected.

Crush Injuries

Severe crushes usually follow explosions of bombs and H.E. shells. They may be due to a direct blow from a mass of material hurled by the explosion, but more commonly occur, both in the field of battle and in injuries to civilians in air raids, when the patient is buried in masses of falling earth or masonry. In such cases the injuries are often widespread. There may be fractures of several limbs, crushes of the chest with fractures of ribs and injury to the lungs, or associated head lesions: with such a diversity of lesions and with the patient in a condition of severe shock an accurate diagnosis may be very difficult and sometimes impossible until a certain amount of recovery has taken place. In this type of lesion rupture of the solid viscera is more common and hence intra- or extra-peritoneal haemorrhage is more frequent than the escape of gastric or intestinal contents, but this may occur, as may rupture of a distended bladder. The symptoms of haemorrhage have been discussed in the first lecture, and it is on their presence and on the steady deterioration of the patient that the decision to operate will be made. Unless the patient is going downhill, as shown by an increase in the pulse rate, abdominal pain and distension, and a marked anaemia, it will often be better to delay operation for a short period. In some cases the haemorrhage will cease, the fullness, mild rigidity, and tenderness of the abdomen become more localized, and later a firm well-defined mass be formed as the blood becomes encapsulated. It may become so sharply defined that it simulates a large abdominal neoplasm. Such changes are more likely

* The second of two lectures on abdominal surgery in war given at the British Postgraduate Medical School, Hammersmith, the first one covering the same ground as the article by Sir James Walton in the *British Medical Journal* of Feb. 21, 1942.

to occur with extraperitoneal haemorrhage around a kidney. The swelling will gradually decrease, taking perhaps 4 to 5 weeks to disappear, but in the end the patient may recover completely, although until the blood is absorbed there is always the risk of its becoming infected and forming a large abscess, which may have to be opened. If the haemorrhage is persisting, or if complete absence of abdominal movement on respiration, increase of pain, the presence of definite rigidity, or evidence of free gas in the peritoneum suggest a perforation of a hollow viscus, the abdomen will have to be opened. Access will as a rule be best obtained by a paramedian incision.

Haemorrhage

Whether the abdomen be opened as a step in the treatment of a perforating wound or on the diagnosis of internal haemorrhage with a crush, its presence will be evident from the amount of blood in the peritoneum. Its source must be located as rapidly as possible. With a penetrating wound the course of the missile will be known either by the presence of a wound of exit or by the radiological examination. With a crush the site of internal injury may be indicated by bruising of the abdominal wall. If absent, the most common sites—liver, spleen, kidney, and mesenteric vessels—must be examined in turn.

The liver is one of the commonest viscera to be injured. It occupies a relatively large area and is of a soft consistency, so that it is easily ruptured. Irregular tears may run from the free margin into the substance and bleed very freely. Much has been written on the assumed difficulty of suturing this organ owing to its softness, and many suggestions have been put forward of methods to facilitate the closure. The use of decalcified plates, the suturing in of omentum, or plugging with gauze have all been advocated. In my experience none of these complicated methods are ever necessary. The wound can always be closed by the use of sutures, and since the blood pressure is low bleeding is controlled. It is true there is a tendency for the sutures to cut out, but this can be overcome by the use of thick catgut as a suture material and the use of mattress sutures. When a wide tear is present a long needle loaded with No. 6 catgut should be passed from in front backwards through the whole thickness of the liver on one side of the laceration, across the gap, and up the other side from behind forwards. On this same side it is passed back again from in front backwards about an inch down from its point of emergence, crosses the gap again, and returns on the first side from behind forwards. A large mattress suture is thus passed with one complete loop on one side of the tear and with the two ends ready to be tied as the other loop on the other side. Before tying these ends a second piece of thick catgut is laid under the loop, across the tear, and under the two ends to be tied; these two ends are now steadily tied and, having a wide bite of the whole thickness of the liver, will not readily cut out. The mattress suture, however, approximates the posterior edges but leaves the anterior gaping. The two ends of the second piece of catgut which passes under both loops are now tied; this tightens up the mattress suture and approximates the anterior edges. I have never known this suture cut out or fail to control the haemorrhage. For a large tear several such sutures may be required.

Perforating wounds made by a bullet or piece of H.E. shell can be closed by simple sutures, but in the latter case care must be taken to see that the piece of metal is not lodged in the liver. If so, it can usually be felt with a probe and extracted with long forceps. At times it may be impossible to extract, but its retention is always apt to be followed by abscess formation. The suture of a simple tear and the control of haemorrhage are unlikely to be followed by any complication.

The other most common source of haemorrhage is a rupture of the spleen. In many cases this organ has been torn after quite slight accidents. Patients have tripped over an uneven surface and, falling on the left side of the abdomen, have suffered from a severe internal haemorrhage due to an injury of this nature. In some cases there has been a curious delay between the injury and the onset of the symptoms of haemorrhage. The explanation of this is believed to be that the spleen pulp ruptures and forms a large haematoma under the relatively tough capsule, which gives way only after some hours or days; free haemorrhage into the peritoneum then occurs. The site of the haemorrhage can usually be determined from the fact that the blood is seen to be passing down from the left upper quadrant, and the tear in the spleen can usually be felt. By hooking two fingers over the gland and round the pedicle it can usually be drawn forward and inspected; if fixed, as it frequently may be if the site of previous disease, the paramedian incision should be carried up to the xiphisternal notch and, if right-sided, the falciform ligament should be divided between ligatures. If access is still insufficient the surgeon should have no hesitation in cutting the left rectus across in an upper and outer direction; this T-shaped incision always gives a good view. No attempt should be made to suture the organ, as its substance is much too friable. Fortunately its loss is readily compensated and no ill effects follow its removal. Haemorrhage can be easily controlled by gripping the pedicle, dissecting the vein and artery free, and ligaturing them in turn. The vessels may sometimes divide before they reach the hilum, and thus several have to be tied. By ligaturing the vessels independently the risk of injuring or removing a portion of the tail of the pancreas is reduced to a minimum. After removal the pedicle and the bed of the spleen should always be carefully inspected to make sure that the haemorrhage is controlled and to ascertain that the left lobe of the diaphragm has not been lacerated or ruptured. If a tear be found in it, it should be closed with a few sutures. It is in this type of lesion that the insertion of one pint of sterile saline into the peritoneal cavity before its final closure will often be found beneficial, but it should only be used if the injury was a crush, and not with penetrating wounds.

The amount of haemorrhage with a ruptured kidney is very variable. If the cortex has alone been torn there may be only extensive retroperitoneal haemorrhage, causing pain and some rigidity and tenderness in the loin on one side of the abdomen. Sometimes there is no haematuria, the presence of which means that either the pelvis or one of the calices has been injured. In such a case it may be very extensive and may, indeed, cause the bladder to fill with clot and give rise to clot retention. The peritoneum over the front of the kidney may be torn or cut by a missile, in which case the blood will pass freely into the peritoneum and the loss may be much more extensive. In some of these cases the decision as to the need for operation may not be easy, but will be based upon the amount of bleeding, whether internal or external. Since there may be doubt as to the site of the haemorrhage and of the presence of other lesions, especially if there be a perforating wound, access is usually best obtained by an abdominal approach. If the bleeding is coming from a renal area and if there has been haematuria, the peritoneum over the kidney is divided on the outer side of the colon and the kidney itself turned forward. At times the wound may be sutured and the organ saved; at others a nephrectomy is necessary: generally speaking, the indications for nephrectomy are a tear or injury of the pelvis or main vessels. In such cases the artery, vein, and ureter should preferably be tied separately. If the cortex be alone injured it should be sutured with thick unchromicized catgut, which should be passed as simple sutures. Mattress sutures are not necessary, and should not be used as they may cause wide areas of necrosis.

Rarely with crushes and frequently with penetrating wounds a relatively large vessel in the mesentery or omentum may be injured and lead to severe haemorrhage into the peritoneum. If only partly divided the artery will continue to bleed freely and its ends will not retract, so that it will not usually be difficult to locate; when divided completely the ends may retract from view and, with the patient in a state of collapse and shock, bleeding may temporarily cease. The source of the haemorrhage may then be more easily overlooked, but the tear of the mesentery or omentum will be visible, and in all such lesions divided vessels should be looked for carefully and securely ligatured. With the division and ligature of vessels in the mesentery there is the risk that an adjacent loop of gut has been deprived of its essential blood supply. It must be carefully examined, and if its condition is dubious it must be excised, the resected area passing well beyond the doubtful segment. In cases of doubt a small cut may be made in the doubtful area, free bleeding indicating that the blood supply is satisfactory.

Perforation

Perforations of the hollow viscera may be of all sizes and shapes, and are often multiple: in crush injuries several loops may be caught in the compressing force and cut completely across or show bursting wounds. With penetrating wounds a bullet or piece of H.E. shell may pass through several coils of gut or through the stomach. With a rifle bullet fired from a distance the wounds are more commonly small round punctures through which the mucosa has prolapsed. If inflicted at close quarters or by a ragged piece of H.E. shell there are more commonly large irregular lacerations, and in some cases several inches of the gut may be absent or represented only by a narrow strip of the muscular coat. The amount of shock in these cases is considerable, but only a short time must be allocated to overcoming it; for the results of treatment for all perforations are, as is the case with a perforated ulcer, dependent upon the time at which operation is undertaken after infliction of the injury. For this reason the mortality among patients who have to be transported for a considerable distance is extremely high. When a penetrating wound is present the abdomen will be opened during the necessary exploration of the abdominal wound. Perforations or rupture following a crush injury are not as a rule difficult to diagnose. The pain is severe, respiratory movements of the abdomen are absent, and almost without exception there is a degree of abdominal rigidity far in excess of that which would be caused by a tender and bruised muscle. In some cases there is evidence of free gas in the peritoneum. Here, as in all cases in which there is no penetrating wound, access is best obtained by a paramedian incision. When the peritoneum is opened there will usually be an escape of free gas and a considerable quantity of fluid. In the majority, however, this does not contain visible gastric or intestinal contents. The muscular wall of the gut is so paralysed by the injury that only enough escapes to cause severe irritation and infection of the peritoneum. The fluid is of a slightly mucoid type containing flakes of lymph, which in the later stages rapidly becomes purulent. It is in these cases more than all others that a rapid comprehensive survey is so essential; for not only are the perforations so frequently multiple but there may be additional damage to the solid viscera or other structures. Care must always be taken to examine for the presence of retroperitoneal lesions, which are especially common with the duodenum.

A wound of the stomach will generally be in the neighbourhood of the greater curvature, and may consist of a round or irregular perforation passing through both walls; it is very necessary, if a wound be seen on the anterior surface, that the posterior wall be carefully examined. In other cases a notch may be cut out of the greater curvature. The area posterior to the stomach must also be examined, for the pancreas or other structures may also be injured. The gastric wounds can generally be easily sutured by two layers of continuous chromic gut, the first passing through all coats, and the second, acting as an embedding suture, passing through sero-muscular coats only.

Wounds of the small intestine may be small perforations through both walls, cuts through the mesenteric or antimesenteric borders, or larger and more destructive lacerations. If multiple they may be close together so that there are several wounds in a foot or less of the gut, or they may be more widely separated. Generally speaking, better results follow the suture of several perforations than a resection; therefore, whenever it is possible to close the opening and to leave viable gut with an unnarrowed lumen, this method should be chosen. In order not to narrow the lumen the opening should of course always be sutured transversely to the long axis of the gut. When a portion of the intestine has been severely lacerated, when the mesentery has been severed or so injured that the blood supply has been destroyed, or in some cases where there are multiple wounds in a small area, resection may be necessary. After removing the injured segment widely enough to traverse normal tissue the surgeon may restore continuity by end-to-end suture or by closure of the ends and the performance of a lateral anastomosis. My own preference is always for end-to-end suture, as it can be rapidly performed and leaves no blind ends which might give subsequent trouble.

Injuries of the large gut are of the same general types as those of the small intestine, but the faecal contamination is more likely to be followed by serious infection of the peritoneum and wound. The wall of the large intestine is very thin, and, indeed, one is often struck with wonder, during an operation upon the colon, that an action of the bowels ever takes place; yet this thin-walled viscus is capable of the most powerful contractions. The highly infected contents, which may be solid or semisolid instead of fluid, the powerful muscular contractions, and the thin walls make an aseptic union much less certain than with injuries of the stomach or small intestine. For this reason many surgeons view an excision of a portion of the colon and end-to-end suture with trepidation.

Small wounds should be sutured, and the suture line may be reinforced by the application of near-by appendices epiploicae or a piece of omentum; but larger lacerations are often best treated by trimming up the edges and bringing the injured loop or the separate ends to the surface in the form of a temporary colostomy. Wounds of the lower pelvic colon or rectum should always be sutured, if possible, and an iliac colostomy usually performed above them. In most wounds of the colon the risk of infection is so increased that drainage with a rubber tube should be provided. If there has been a wound of entry or exit through the pelvis this must also be treated on general principles.

The fundus of the bladder may be wounded by penetration of bullets or pieces of H.E. shell if the viscus be distended, and when in a similar state it may be ruptured by a crush injury. Penetrating wounds through the pelvis may also injure the base of the bladder. With these injuries the presence of urine may be recognized in the peritoneum, or the nature of the lesion may have been diagnosed by the presence of haematuria or the inability of the patient to pass urine. Whenever possible wounds of the bladder should be sutured with catgut, but often it will be safer to drain the viscus with a suprapubic tube.

Abdomino-thoracic wounds present a serious problem. The treatment of these dangerous lesions has been admirably described in the comprehensive appendix on chest casualties by Mr. Tudor Edwards in the Emergency Medical Services instructions. He points out that it is essential to operate as soon as the patient is fit enough. These and all other war injuries of the abdomen are also fully discussed in the fascinating monograph *The Abdominal Injuries of Warfare*, by Gordon-Taylor.

If the missile has traversed the lower chest and the *x*-ray plate shows the piece of metal to be lying just below the diaphragm, so that it is certain that the lesions do not extend below the upper abdomen, it is best to deal with the injuries within the thorax as the first step, and then, by excising the wound in the diaphragm and perhaps enlarging it, to repair the visceral lesions within the abdomen, after which the diaphragm is carefully sutured. In many cases, however, the abdominal injury cannot be sufficiently explored by this method, so that after repair of the thoracic injury and the wound of the diaphragm a separate abdominal incision should be made. This is particularly true if the missile has passed downwards into the abdomen.

In some cases the thoracic wound may be of but slight importance but there is evidence of severe abdominal injury; the abdomen should then be opened as a primary measure. In yet others the wound may be at the level of the lower ribs in front, and access may be most readily obtained to both the abdominal and the thoracic cavities by cutting through the costal arch and, if necessary, the diaphragm.

This discussion has of necessity been brief, and I can only hope that I have given you a lead as to the methods you will find most useful. With a rush of casualties you will have to make quick decisions. Like all of us, you will make mistakes, but these will be reduced to a minimum by those who make one orderly investigation, arrive at a certain decision, and act rapidly upon it. Uncertainty and indecision are fatal errors.

L. H. Klinger and S. A. Blauner (*Amer. J. Dis. Child.*, 1942, **64**, 462) record the occurrence of amaurotic family idiocy in identical twin girls. They have been unable to find a similar example in the literature.

CALORIE CONTROL

A NEW DIETETIC TREATMENT OF DIABETES MELLITUS

BY

A. C. CROOKE, M.D.

AND

ELLA SCOTT, S.R.N., S.C.M.

(From the Diabetic Departments of the London Hospital and Oldchurch Hospital, Romford)

Before the discovery of insulin the treatment of diabetes mellitus was essentially dietetic. It consisted in a severe restriction of the total calorie value of the food, with a relatively high proportion of protein and fat and a low proportion of carbohydrate. Subsequently a change in the diet of the diabetic patient requiring insulin was effected very slowly; indeed, 10 years after the discovery of insulin many patients were still being given diets similar to those of the pre-insulin period. In the last 10 years or so they have generally been allowed to increase the total calorie intake and the proportion of carbohydrate to protein and fat. It has long been our custom to give patients who are not excessively obese a diet which corresponds as nearly as possible to that which each individual might be expected to take if he had not got diabetes mellitus. The patient is encouraged to say if the diet is adequate or not, and adjustments are made accordingly. The total intake of carbohydrate, protein, and fat is controlled so that it does not vary from day to day, and the amount of insulin required to balance the patient is then determined by trial.

The dietetic restrictions necessitated by war have demanded a reconsideration of the problem of diabetic diets. The Government has allowed diabetic patients extra protein and fat but less sugar, yet it has not been possible for them to continue with their pre-war diets. In June, 1941, we began to try a new diet system which aimed at keeping the total calorie value of the food constant from day to day while allowing complete freedom of choice of food. Thus the patient can take a protein-and-fat breakfast of bacon one day and a carbohydrate breakfast of cereal the next. The new diet has proved to be very much easier for the diabetic to use, because the system eliminates the necessity for dividing different foods into carbohydrate, protein, and fat varieties, and because a much wider choice is available for each meal.

The Diet

TABLE I.—*Sample Diet of 2,000 Calories*

	Calories
Breakfast (450 calories):	
Tea or coffee, with milk ¼ pint	50
Oats or cornflakes, 1 oz.	100
Bacon, 1 oz.; or 1 egg plus ½ oz. margarine or butter	150
Bread, 1½ oz.	100
Butter, ½ oz.	50
Mid-morning.—Tea or coffee, with milk ¼ pint, and 1 biscuit (½ oz.)	75
Dinner (500 calories):	
Lean meat, cheese, or fish to the value of	150
Fat meat or butter, ½ oz.	50
Cabbage, cauliflower, sprouts, leeks, marrow, onions, lettuce, tomatoes, or radishes as desired	—
Potatoes, 4 oz.	100
Bread, ½ oz., or vegetables to the value of	50
Rice, tapioca, or sago, ½ oz., or fruit to the value of	50
Milk, ¼ pint	100
Tea (425 calories):	
Milk, ¼ pint in tea	50
Bread, 3 oz.	200
Butter or margarine, ½ oz.	50
Jam, 1 oz.	75
2 plain biscuits (½ oz.)	50
Supper (550 calories):	
Fish, cheese, or meat to the value of	150
Potatoes, 4 oz.	100
Vegetables as at dinner	—
Bread, 2½ oz.	150
Butter, ½ oz.	50
Fruit to the value of	50
Milk, ¼ pint in tea or coffee	50

You can take the whole of your dinner in the form of sandwiches: bread 3 oz., butter ½ oz., meat or cheese to the value of 150 calories; milk, ¼ pint. In a temporary emergency you can take each of your four meals in the form of bread—five 1-oz. slices, and butter or margarine ½ oz.

If you are unwell and cannot eat your usual diet continue to take your habitual dose of insulin at the usual time and, in place of each of your four meals, take 20 lumps of sugar in tea or water.

The principle of the diet is to arrange each meal on the basis of a given number of units of food each equivalent to 50 calories. The patient is given a sample diet of 2,000 calories, which is typed on a sheet of foolscap paper (Table I). The diet can be readily increased by adding other units on the dotted lines provided for this purpose beneath each meal, or reduced by striking out unwanted units. On the reverse side of this diet sheet is typed a large variety of alternative foods in alphabetical order (Table II). Against each food is given the amount, in ounces, which yields approximately 50 calories. These figures are based on the food values given by McCance and Widdowson (1940).

TABLE II.—*The Following Quantities of Food each yield 50 Calories*

	oz.
Apples, English eating, with skin and core	4½
,, cooking, raw	4½
,, stewed without sugar	8½
Apricots, dried, stewed without sugar	2½
,, fresh	5½
Arrowroot	½
Bananas, without skin	2
Beans, baked	1½
,, broad, cooked	4
,, butter, boiled	1½
Beetroot, boiled	3½
Biscuits	½
Blackberries, raw	5½
Bournvita	½
Bread	½
Carrots, boiled	8½
,, raw	7
Cherries, cooking, raw, with stones	4
,, eating, with stones	4
Cocoa	½
Cornflour	½
Cranberries	10
Currants, black, raw	5½
,, red, raw	7
,, dried	½
Custard powder	½
Dates, without stones	½
Figs, dried, raw	½
Flour	½
Golden syrup	½
Gooseberries, dessert	4½
Grapes, black	3
,, white	2½
Honey	½
Horlick's	½
Jam	½
Kellogg's cornflakes, All-Bran	½
Leeks, boiled	7
Lentils, raw	½
Loganberries, raw	10
Macaroni	½
Marmalade	½
Melon, yellow, with skin	12½
Milk (¼ pint)	2½
Oatmeal	½
Oats, Quaker	½
Onions, boiled	12½
,, spring, raw	4½
Orange juice	4
Oranges, without peel or pips	4½
Ovaltine	½
Parsnips, boiled	3
Peaches, dried, raw	½
,, fresh	4½
Pears, cooking, stewed without sugar	6½
,, eating	4½
Peas, dried, boiled	1½
,, fresh, boiled	3½
Pineapple, fresh	3½
Plums, eating, with stones	4½
,, cooking, raw, with stones	7
Potatoes, boiled	2
,, chip	½
Prunes, stewed without sugar	2½
Raisins	½
Raspberries, stewed without sugar	10
Raspberries, raw	6½
Rice	½
Sago	½
Strawberries, raw	6½
Sugar	2 lumps
Sultanas	½
Swedes, boiled	10
Tapioca	½
Tomatoes	12½
Cheese	
Cheddar	½
Dutch	½
Gorgonzola	½
St. Ivel	½
Fats	
Butter	½
Clotted cream	½
Cream	½
Margarine	½
Meat fat	½
Fish	
Bloater, with bone and skin	1
Cod, steamed	2½
Eel, stewed, with bone	1
Haddock, smoked and fresh	1½
Hake	1½
Kipper, with bone and skin	1½
Lemon sole, steamed	2
Mackerel, fried	1
Plaice, steamed	2
Salmon, fresh	1
,, tinned	1½
Sardines	½
Skate, fried	½
Sole, steamed	2
Whiting	2
Meat	
Beef, sirloin, lean, roast	½
,, steak, stewed	½
Chicken	1
Corned beef	½
Duck	½
Goose	½
Ham, boiled, lean	½
Kidney, sheep, raw	1½
Liver, fried	½
Mutton chop, lean, raw, with bone and fat	2½
,, leg, roast	½
,, scrag neck, stewed	½
Pork, leg, roast	½
Rabbit, stewed	1
Tongue	½
Tripe, stewed	2
Turkey	1
Veal, fillet, roast	½

Egg: 50 calories

Bacon: 1 oz. fried—150 calories

Unlimited amounts of the following: Asparagus, brussels sprouts, cabbage, cauliflower, celery, cucumber, endive, French beans, globe artichoke, gooseberries (stewed without sugar), lettuce, lemon juice, mushroom (stewed), mustard and cress, rhubarb (stewed without sugar), spinach, turnip tops, watercress.

Results of Treatment

We have examined the records of all cases which have attended the diabetic departments of the London Hospital and Oldchurch Hospital since September 1, 1941. We chose this date because it was the day on which we first began to treat large numbers of cases with the new diet. Altogether 766 patients have attended, and 528 of these are using the calorie control diet. The cases have been subdivided into groups, which will be referred to as severe, mild, and old. All cases requiring 60 or more units of insulin daily have been classed as severe. Cases under 60 years of age requiring less than 60 units of insulin a day have been classed as mild. Cases aged 60 years or more requiring less than 60 units of insulin a day have been classed as old. The group of 528

cases using the calorie control diet have thus been subdivided as follows:

(A) Cases requiring insulin		477
Severe	107	
Mild	239	
Old	131	
(B) Cases not requiring insulin (all ages)		51

The general health of the patients in all groups has been as good on the new diet as on the old. There has been no increase in the frequency of insulin reactions or of diabetic coma; indeed, some of the most unstable cases have been more stable on the new diet. The difference in efficiency which exists between the calorie control diet and the old one is slight, and an accurate estimate of it can only be made by comparing the condition of each patient before and after starting the new diet. We decided, therefore, to take for this comparison only those cases requiring insulin which had attended the clinics regularly for a period of three months before and three months after first receiving the new diet. This excluded a large number of fresh cases which started using the new diet at the beginning of their treatment, many old cases which had not been seen for a long time owing to evacuation or other causes and which started the new diet immediately they returned, and some patients who did not attend regularly. Altogether only 192 out of 477 cases requiring insulin were suitable for further analysis. In this group a comparison was made between the body weight, insulin requirement, and amount of glycosuria during the three months before and the three months after starting the new diet. The results have been recorded as increased, unchanged, or decreased—representing the change that has occurred since the diet was altered. They are shown in Table III, in which the figures represent the number of cases in each group.

TABLE III

	Cases		Weight	Insulin	Glycosuria
Severe ..	47	Increased	20	24	7
		Unchanged	19	10	27
		Decreased	8	13	13
Mild ..	92	Increased	46	36	7
		Unchanged	37	29	58
		Decreased	9	27	27
Old ..	53	Increased	20	25	8
		Unchanged	20	22	32
		Decreased	13	6	13
Total ..	192	Increased	86	85	22
		Unchanged	76	61	117
		Decreased	30	46	53

The figures show a significant increase in the body weight in all groups. The number of cases requiring more insulin is nearly double the number of those requiring less, but there is a significant decrease in the amount of glycosuria in all groups. The changes in body weight and in the amount of glycosuria are therefore satisfactory, but the increase in the amount of insulin required might appear at first to be an unsatisfactory feature. Actually this is not so, because there is a natural tendency for diabetic patients to need more insulin in the course of time. We investigated the alteration in insulin requirements during a similar period of six months in a group of 100 unselected cases which were having the old type of diet throughout this period. In 39 cases the insulin requirement had increased, in 34 it was unchanged, and in 27 it had decreased. These figures may be compared with the figures in Table III. In the whole group of 192 cases the insulin requirement had increased in 44%, was unchanged in 32%, and had decreased in 24%. Another explanation of the increased insulin requirement is to be found in the greater total calorie value of the new diet compared with the old one. We analysed the calorie value of the diets in all the 192 cases requiring insulin and recorded it as increased when the new diet was more than 50 calories in excess of the old one, unchanged when it was within 50 calories of the old one, and decreased when it was less than the old one by more than 50 calories. We found that the diet had been increased in 98, was unchanged in 58, and had been decreased in 36 cases. We then compared the number of cases in each group with the change in insulin requirement; the results are shown in Table IV, the figures representing the number of cases in each group.

TABLE IV

	Insulin		
	Increased	Unchanged	Decreased
Diet increased ..	49	30	19
„ unchanged ..	21	18	19
„ decreased ..	15	13	8

In the group in which the calorie value of the diet had been raised the insulin requirement had increased markedly, but in the other two groups it had increased only slightly. This increase is less than would be anticipated from a comparison with the above-mentioned 100 cases, whose insulin requirement was observed for a period of six months while they were on the old diet.

Discussion

There is no adequate explanation of the effectiveness of the calorie control diet that can be based on our present knowledge of the physiological action of insulin. It is often assumed that when the carbohydrate value of a diet is increased the insulin requirement will also be increased. The idea conforms with the old conception that a fixed amount of insulin is necessary to utilize a fixed amount of carbohydrate. Actually when the carbohydrate value of a diet is raised the insulin requirement generally falls, provided the total calorie value of the diet is not altered. This effect was shown in a remarkable way by Prof. Ellis at the London Hospital in 1934. He found that severe cases of diabetes mellitus receiving daily 600 g. of glucose alone developed a marked temporary improvement in carbohydrate tolerance, necessitating the use of smaller doses of insulin. In the most notable instance in his series the reduction of insulin was from 192 units daily before the administration of glucose to 9 units daily on the twenty-first day after this treatment was begun. This interesting observation has received scant attention; but it forms a rational basis for the present treatment of diabetic coma with 4-hourly glucose and insulin, and offers an explanation of the effectiveness of our calorie control diet. It explains why the insulin requirement is actually less than anticipated in those cases in which the calorie value of the new diet is the same as that of the old one. It even suggests that patients might become reactionary as a result of taking the extra carbohydrate which is made available to them, but there has been no increase in the number of reactions reported by our cases.

The rate of change in the carbohydrate tolerance which occurs when carbohydrate foods are interchanged with protein and fat foods of the same calorie value by patients using the new diet is not rapid enough to cause instability, but in order to test the extent of permissible variation in the proportion of carbohydrate to protein and fat in the daily diet an experiment was undertaken at Oldchurch Hospital. Eight cases were chosen, including three of the most unstable diabetic patients attending either hospital. Each case was treated as an in-patient and was given a diet in which the proportion of carbohydrate, protein, and fat was kept constant at a normal level. The patients were made as stable as possible with insulin. The diet was then changed to an almost completely carbohydrate one of the same calorie value for two days. After this for another two days it was altered to one of the same calorie value consisting mainly of protein and fat. The carbohydrate diet was then repeated for two more days and the protein and fat one for a further two days. After this the patients returned to their normal diet. The blood sugar was estimated every two hours for 12 hours at the beginning of the experiment while the patient was on a normal diet. This was repeated on the second day after each subsequent change of diet, ending on the second day after returning to normal diet again. The six blood-sugar curves thus obtained were compared, and it was found that the range of values was of the same order in each case. The variation in the proportion of carbohydrate, protein, and fat in these diets was far greater than is ever likely to occur under normal circumstances. The experiment confirmed our belief that the unlimited interchange of these different foods which is allowed

by the new diet is permissible even for the most unstable diabetic patients.

The calorie control diet has proved to be as satisfactory in every way as the older type of diet in use in these clinics. It is more simple to use, and it allows patients to replace foods that are scarce with foods that are plentiful. This has also meant that the diet is cheaper, since the carbohydrate foods in general are cheaper than the protein and fat foods which they have replaced. Finally, a group of patients, including some severe cases, have agreed to forgo the extra rations allowed to them by the Government, and they have remained just as stable and well without them. We believe, therefore, that even if the food rations have to be still further reduced and the diet of diabetic patients is affected they could be maintained in good health on the new diet.

Summary

A diabetic diet is described in which the total calorie value is kept constant but an unlimited variation in the proportion of carbohydrate, protein, and fat is permitted.

The effect of this diet has been examined after one year's trial on a large series of cases and found to be satisfactory.

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THE ACTION OF RADIANT-HEAT CRADLES

BY

G. MALCOLM BROWN, M.D., Ph.D.
DAVID S. EVANS, M.A., Ph.D.
AND
K. MENDELSSOHN, M.A., Ph.D.*

(From the Nuffield Department of Clinical Medicine, Oxford)

The Physical Action of Cradles

The cradles used were those issued by the Ministry of Home Security, consisting of a sheet of polished metal bent in the shape of a horseshoe, and fitted with 12 carbon filament bulbs of 230 volts and 16 c.p. (about 65 watts) controlled by two switches. Each switch controls 6 bulbs and is so arranged that 2, 4, or 6 bulbs can be switched on. The object of the cradle is to supply heat to patients, and our primary aim was to investigate how this end was achieved by this type of cradle. It was also hoped that an analysis of the factors involved might suggest improvements in the apparatus.

The usual method of employing such cradles is to place the patient inside, covered with a blanket, and to drape another blanket over the whole cradle so as to retain the heat. The radiation emitted by the bulbs consists almost exclusively of infra-red rays of long wave-length, the remaining small percentage being emitted as visible light and short-wave infra-red rays. This radiation either falls directly on the blanket-covered patient or is reflected without change of constitution from the polished surface of the metal background. A certain amount is absorbed by the background, and the latter is gradually raised in temperature until it forms a source of long-wave infra-red radiation on its own.

Before reaching the patient, however, the radiation encounters the blanket, which becomes warmed on its upper surface and radiates heat as long infra-red rays on its own account. A certain amount passes through the blanket to the patient; but since the blanket is a good insulator, this is a very inefficient method of transferring heat. The energy which reaches the patient is thus much reduced in amount, but has been converted by the action of the blanket into very long infra-red rays. Some such convertor mechanism appears to be necessary; for, as we shall see, when a patient is placed in the unshielded cradle without the protection of a blanket he soon begins to suffer from burns. A mode of conversion was therefore adopted which involved a negligible loss of energy.

* With a personal grant from the Medical Research Council.

The metal background of the cradle was blackened† and the bulbs were covered with strips of thin metal which cut off the direct radiation completely, but which rapidly became hot and acted as a source of long infra-red radiation like the cradle background (Fig. 1). The blackening of the background ensured 100% absorption of the direct radiation incident upon it from the bulbs, so that in this "shielded" cradle the heat transmitted to the patient is furnished only by the thermal radiation of the cradle background and the shielding strips.

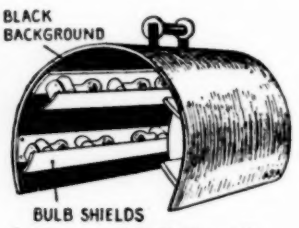

FIG. 1.—Modified cradle.

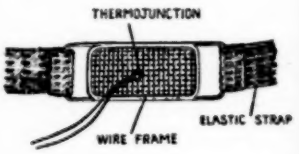

FIG. 2.—Skin thermometer.

In order to measure the radiation a small blackened square of copper was used, the temperature of which was measured by means of a thermo-junction fixed to its back. As this is heated by the incident radiation, which it absorbs completely, the radiation emitted from its surface is also increased, until after a few seconds the receiver is in equilibrium with its surroundings and emits as much as it absorbs. The temperature of the receiver is then the same as the effective temperature of the radiation field, provided that no heat conduction takes place.

For the physiological part of the investigation a suitable skin-temperature thermometer had to be devised. The form adopted (Fig. 2) consisted of a small grid about 4 cm. by 2 cm. of fine copper mesh carrying a thermo-junction on the side in contact with the skin, the whole being protected by a thin coat of shellac varnish. The junction thus gave a mean value of the skin temperature over the whole area covered by the mesh because of the good heat conductivity of the latter. The skin was exposed to the air and was free to sweat, while the area obstructed by the wires of the mesh was sufficiently small not to interfere with the full access of the radiation to the skin. Three such instruments, of mesh sizes from 1 mm. to 2 mm., were found to give consistent readings over a wide range of radiation temperatures and air temperatures.

Experiments were carried out with a blanket over the cradle and all 12 bulbs switched on. The radiation meter was placed a few centimetres above bed level in the centre of the area covered by the cradle. Fig. 3 shows graphs of the observed temperatures of the receiver plotted against time. The receiver is affected by radiation from the bulbs and from the metal background, as well as by conduction through the air. The room temperature is represented by 0A and the cradle is switched on at A. In the unshielded cradle the curve ABC is followed. At C the bulbs are switched off and the temperature immediately falls to F and dies away along FG as the cradle begins to cool.

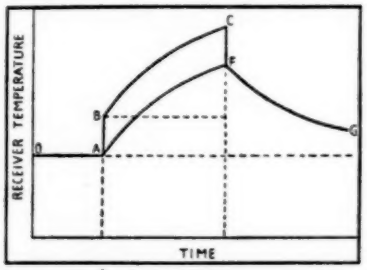

FIG. 3.—Radiation from shielded and unshielded cradle. For details see text.

In the shielded cradle, in which direct radiation from the bulbs is absent, the curve AFG is followed. Thus the contribution AB must be due to the direct radiation from the bulbs. This component of the radiation remains constant in time, as is evident from the fact that when the bulbs are switched off at C the drop in radiation recorded, CF, equals the initial rise, AB. The curves AF and BC are almost identical,‡ and this implies that the amount of heat supplied by the bulbs to the cradle background is the same whether

† A thin coat of any flat black-out paint, not water-soluble, is suitable.

‡ This is strictly true in an energy–time diagram, and is almost exact in our temperature–time diagram because of the very small range of temperature involved.

the bulbs are shielded or not. This is also corroborated by the fact that a few minutes after the bulbs have been switched off the radiation recorded in the shielded and that in the unshielded cradle are identical. This means that the direct radiation from the bulbs plays only a very small part in the total energy supply to the patient. The radiation from the background, however, which is represented by AF, increases steadily. Thus we have been able to separate the two components of the radiation from one another.

We have so far omitted from our discussion the question of heat conduction by the air in the cradle. In fact, such conduction does take place, and even plays a considerable part in the heat transfer between cradle background and patient. The existence of this conduction, however, does not affect our conclusions, since there exists no direct heat conduction between the filaments of the bulbs and the patient, and heat conduction through air, as well as convection, takes place only between the cradle background and the patient. These effects are thus the same in the shielded and unshielded cradles.

Thus it appears that during the first few minutes the shielded cradle delivers rather less energy than the unshielded, but the amount of energy which can be delivered to the patient is very much greater in the former, since the conversion to long-wave radiation has already been carried out, whereas in the unshielded cradle the patient will only get what can eventually filter through a blanket.

The Physiological Action

The skin temperature of volunteers was measured in the two cradles. In each case a blanket was draped over the whole cradle and *the volunteer placed naked inside*. As was to be expected, the skin temperature rose in the first few minutes more rapidly in the unshielded cradle, but in both cases the same temperature (about 45° C.) was reached after about 15 minutes. While, however, this was very unpleasant under the unshielded cradle, no discomfort was felt in the shielded cradle. In the subsequent few minutes in the unshielded cradle first-degree burns developed, but no ill effects were suffered in the shielded cradle.

It is therefore clear that burning must be due to the direct radiation from the bulbs, which is present only in the unshielded cradle. As we have seen, this direct radiation forms a comparatively small fraction of the total heat output of the cradle, and it is evident that the burns are caused rather by the particular constitution of the direct radiation, which contains a certain amount of short-wave infra-red rays (0.4 to 4 μ), than by the amount of energy supplied. The shielded cradle emits thermal radiation with a maximum at 7 μ. It is not the total amount of thermal energy supplied by the unshielded cradle which limits its application, but the fact that the direct radiation from the bulbs can be tolerated by the skin for a comparatively short time only. This is, in fact, the reason why it has been found necessary to insert a blanket between the patient and the cradle. Though this acts as a convertor from short-wave to long-wave radiation, it cannot fulfil this purpose as efficiently as the blackened cradle background.

It was clear that the new shielded cradle could safely be used without protecting the patient with a blanket, while the old unshielded cradle could not. In order to test the efficiency of the two cradles as heaters a comparison was made between *the unshielded cradle with a single blanket over the patient and the shielded cradle with the patient naked*. In both cases blankets were draped over the whole cradle. Volunteers were placed in each of the cradles in turn on different days and heated with 12 bulbs until the oral temperature reached 100° F. or until the oral temperature remained constant for so long that it was clear that no further rise would take place. It was found that the best position was when the upper edge of the cradle was level with the lower end of the sternum. Observations of oral temperature and of skin temperature on the abdomen and thigh were made. Altogether 6 volunteers were heated, giving a total of 12 experiments. Two of the 6 cases were not conclusive. In one an oral temperature of 100° F. was reached in both cradles, and in the other this temperature could not be reached in either cradle. In the latter instance the cradle was placed considerably lower than the height which we have since found to be the optimum.

A typical result is shown in Fig. 4. In the shielded cradle the skin temperature rose to a roughly constant value of just under 45° C., although the temperature of the radiation field was almost double this. The oral temperature rose rapidly after about 30 minutes. In the unshielded cradle the skin temperature follows the same trend, but remains at a slightly lower level. The oral temperature could not be increased above 99° F. even by heating for 90 minutes. In this particular case the oral temperature reached 100° F. in the shielded cradle after 47 minutes' heating. This was almost the

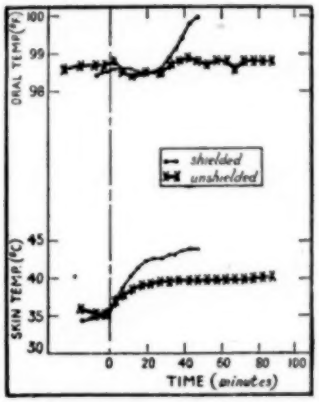

FIG. 4.—Oral and skin temperature of a patient heated in the two cradles. The shielded cradle is a more efficient heater owing to absence of necessity for skin protection.

shortest time taken to attain this level with the shielded cradle, the shortest being 42 minutes.

It will be seen that there was a drop in the oral temperature after the cradle was switched on. This phenomenon occurred in both the shielded and the unshielded cradles. In 9 out of the 12 cases observed there was a decrease of oral temperature of 0.3 to 0.5° F., which took place in from 5 to 20 minutes after the heat was turned on, and thereafter the temperature rose steadily. The blood pressure, both systolic and diastolic, also fell slightly during the first 20 minutes. After that the systolic pressure and the pulse rate usually rose above the initial values; the diastolic pressure tended to remain low.

Comparing the two types, we find that the shielded cradle is definitely more efficient as a means of raising the body temperature than the unshielded. There is a very considerable scatter in the results, but we have plotted for each experiment a point representing the rise in body temperature during the experiment against the time for which the heat was applied (Fig. 5). The mean of all the shielded results falls well above the mean of the unshielded results, the slope of the dotted line in the former

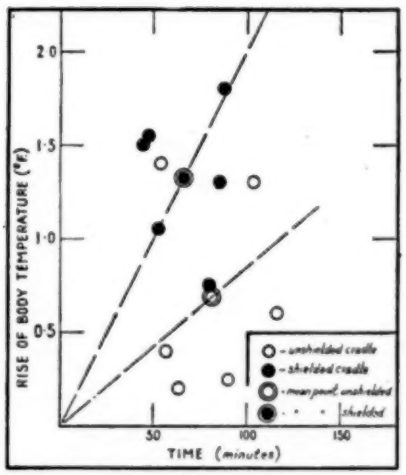

FIG. 5.—Rise of body temperature plotted against time of exposure for 12 experiments.

case being over twice the slope of the latter. All the inconclusive cases are included in this diagram—a representation which does less than justice to the shielded cradle, since an unshielded case in which the temperature refused to rise above a certain level would have been represented by a still lower mean rate of rise if the experiment had been continued longer.

Even with the shielded cradle it was found that if the heating was continued at full strength for a considerable time a burning sensation was experienced and erythema developed. This is due to the fact that the cradle background gets steadily hotter and delivers a steadily increasing amount of energy; in fact,

the system shows no sign of reaching equilibrium after more than two hours' heating. This means that under these conditions the patient is subjected to an ever-increasing flow of heat and that sooner or later the threshold for tolerance must be reached. The ideal situation would be one in which the patient received a constant flow of heat of tolerable strength. This can be achieved by switching off a number of the bulbs after an initial boost with 12 bulbs.

Investigations with a radiation meter were carried out in order to determine how many bulbs are needed to maintain a constant heat flow at various levels. Experiments were made by switching on 12 bulbs for a standard time (20 minutes) and then changing to the required number of bulbs. After falling for a short time the heat flow then became constant. For instance, when two bulbs only were left on after the boost, the temperature eventually fell and remained at 37° C. During the boost with 12 bulbs this level had been reached after about 8 minutes, and it was found that using 12 bulbs for 8 minutes and then switching to 2 produced the final equilibrium conditions in a few minutes, without at any time exposing the patient to more radiation than was needed.

Instructions for Use of the Shielded Cradle

It is suggested that the shielded cradle should be used by boosting for a certain time with 12 bulbs and then turning down the heating so as to maintain a heat flow of the desired strength. The accompanying table shows the times recommended for this procedure as suggested by these experiments (Fig. 6).

Boost Time with 12 Bulbs in Minutes	Final Radiation Temperature (° C.)	Number of Bulbs for Final State
8	37·0	2
12	47·5	4
32	63·5	6
60	73·0	8

It should be added that boosting with 12 bulbs for more than 40 minutes sometimes caused the patient's skin to become irritated. The kinder way is to apply 12 bulbs for 25 to 30 minutes, then 10 for about 20 minutes, and 8 thereafter. This

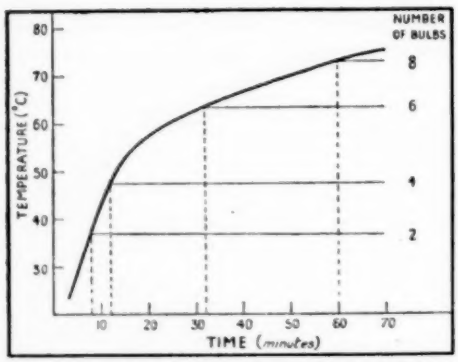

FIG. 6.—Chart showing boosting-times for the shielded cradle.

is very little slower, and it causes far less discomfort. Irritation and erythema develop in the region of the groin at much lower rates of heating than anywhere else on the skin, and we have made it a standard practice to cover this region with a folded towel. To protect a restless patient from contact with the hot cradle we have used a guard of strong wire, similar to those ordinarily employed to lift the weight of blankets off the legs and feet. The wires of the guard were covered with two layers of white bandage, which kept it sufficiently cool, and distance pieces were fitted to hold the guard in the correct position.

Some Further Investigations

A female patient suffering from arthritis was treated at various heating rates. Four experiments were made with 4, 6, 8, and 8 bulbs respectively, the boosting-times being regulated as above. Using 4 bulbs, the body temperature rose from 98.4° F. to 100° F. in 1 hour 55 minutes, including the boosting period. With 6 the rise was from 98.0° F. to 100.1° F. in two hours; with 8, rises from 99.5° F. to 101.8° F. in 1 hour 15 minutes and from 97.8° F. to 100.8° F. in 1 hour 35 minutes were secured. Thus the temperature can be raised quite comfortably at a fairly considerable rate. It immediately suggested itself that there might be a relation between the rate of rise of temperature and the heat input. The observational material was analysed by taking each

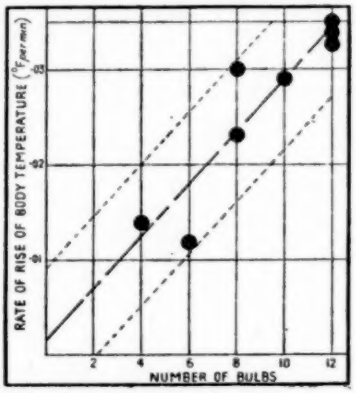

FIG. 7.—Diagram showing correlation between heat input and rise of body temperature.

period over which the heat input was constant and noting the rise of temperature in that time. The mean rate of rise was thus obtained for each heating rate, and from the observational records of this patient 8 points were obtained. A scatter diagram was plotted (Fig. 7), and it was found that all the points lay on a narrow band passing through the origin.

While the results are certainly too scanty for a definite opinion to be formed, it is possible that such a correlation may exist for each individual case. If this is true a single determination of the rate of rise of body temperature at a given heating rate would form a valuable guide to the heat response and further treatment of the patient, since it would thus be possible to predict the rise in body temperature for any other heating rate. It should be noted, however, that the observed correlation relates only to the region between normal temperature and 102° F. and may not be continued to higher temperatures.

Discussion

This investigation was undertaken after two serious burns had occurred with the use of the Ministry of Home Security heat cradle. Questioning of senior sisters revealed no standard procedure in the heat-cradling of cold or shocked patients, and none was found in the literature. Aside from this lack of knowledge concerning the proper use of a powerful instrument, it was obvious that the cradle was needlessly dangerous, and that the customary procedure which made it tolerable—the protection of the patient by a blanket—greatly reduced its efficiency. Heat administration should be as carefully controlled as the administration of drugs or oxygen.

By simple modifications which a handy-man can carry out in an hour or so, a heat cradle has been devised which gives complete protection from early burns and which heats the patient much more quickly. The near infra-red component of the radiation has been converted with negligible energy loss to far infra-red, a type of radiation for which the skin has evidently a greater tolerance. This permits the withdrawal of the protection afforded by the blanket. The ability to control the dosage of heat accurately has resulted in the elimination of late burns, and is of obvious value in careful treatment. With the shielded cradle it is possible to expose the patient in a heat bath at any desired temperature without ever exceeding that temperature.

There remain certain dangers. With the unshielded cradle the risk of burning the skin, or actual burns, must often have prevented the introduction into the body of a dangerous amount of heat. When that costly safeguard is removed, more careful supervision of heat treatment is demanded Under some conditions we have found that the patient's temperature rose at the rate of 2° F. in 20 minutes. This is a state which demands skilled observation, and we are firmly convinced that medical officers should supervise the use of the heat cradle more closely and not regarded it as an instrument which can be left without instruction to the nursing staff.

The question of the place of heat in the treatment of shock is made more urgent by the more efficient cradle. There is

little doubt that it can be overdone. Blalock and Mason (*Arch. Surg.*, 1941, **42**, 1054) have found that exsanguinated and traumatized animals survive longer if they are cooled rather than warmed, and our own observations show that soon after the application of heat the blood pressure falls. Vasodilatation of the skin and enlargement of the vascular bed may well be harmful in shock. Some experimental work is being carried out to elucidate this point, but there is need for more observations on shocked patients.

Summarized Instructions for Use of the Shielded Cradle.—(1) Place the upper end of the cradle at the level of the lower end of the sternum. (2) Cover the cradle and its open ends with two blankets, and do not disturb these unless absolutely necessary. (3) Leave the patient naked except for a small hand towel to protect the groins, and if the patient is restless insert the guard (see above). (4) At first turn on all 12 bulbs. (5) After not more than 30 minutes reduce the bulbs to the number required to maintain the air temperature at the desired level (see Fig. 6). (6) Determine the oral temperature at least every 15 minutes.

Summary

The heat cradle issued by the Ministry of Home Security has been modified by shielding the bulbs and blackening the reflector.

As a result of the conversion of the short-wave infra-red radiation into long-wave infra-red the risk of burns is almost eliminated and the patient can be heated at least twice as rapidly.

The danger of overheating the patient is emphasized.

Instructions are provided for using the new cradle.

We should like to thank Prof. Witts for his interest and suggestions. Our thanks are also due to the volunteers who were used in the experiments, and to Mrs. V. Launchbury, who gave technical assistance.

SYPHILIS TREATED WITH DAILY MULTIPLE INJECTIONS OF MAPHARSIDE

BY

J. KVITTINGEN, M.D.

Surg. Lieut.-Cmdr., Royal Norwegian Navy

When Norway was invaded by Germany in April, 1940, a large part of the Norwegian Merchant Navy was isolated from its bases and eventually made its way to this country. In spite of dangers and hardships these ships continue their hazardous work, and it is not difficult to understand why, under prevailing conditions, the crews become easy victims to venereal disease when they are in port. There has been a serious increase in syphilis and other venereal diseases amongst the crews of these vessels; this constitutes a grave problem for the authorities at the present time and points to future difficulties in our social welfare. Before the war fresh cases of syphilis in Norway were very rare, and in 1938 there were only about 200 new cases amongst the whole population.

Routine treatment of syphilis is possible only if a sailor stays ashore for any length of time; but in most cases this cannot easily be arranged; and, furthermore, life ashore often has a demoralizing effect upon the men. Many who contract venereal disease come to the clinics only at irregular intervals, and treatment is necessarily unsatisfactory. These conditions obtain not only in the Merchant Navy but also in the smaller vessels of the Navy proper, and the smaller Army groups, none of which has a doctor on the staff.

At the beginning of 1942, following a review of syphilitic cases treated in the clinic, it was found that less than 30% of the patients were being adequately treated, and it was decided to start intensive arsenical treatment at the Norwegian Naval Hospital. Continuous intravenous drip therapy, using neoarsphenamine, has been tried in America (Chargin *et al.*, 1935), but the drug proved to be too toxic, peripheral neuritis being one of the most frequent complications. Later it was found that "arsenoxide" (mapharside), given in massive doses by the intravenous drip method, caused appreciably fewer toxic effects than neoarsphenamine (Chargin, 1940). Even so, the method presented difficulties, and massive arsenotherapy, using multiple-divided doses, eventually came into use. Gordon (1941), and later O'Malley (1941), in South Africa, employed a course of treatment consisting of five doses, each of 0.02 g., of mapharside at two-hourly intervals daily for a period of five days. At the same time 25 oz. of a 10% solution of glucose by mouth, spread over the day, were given during the period of treatment. Similarly, other workers in America have administered the drug by multiple doses, but, for the most part, have given two injections daily for a period of five days.

Method of Treatment

It was decided to follow the South African method, but to give larger doses of mapharside. On Feb. 2, 1942, treatment was begun, and by June 25 one hundred patients had completed the course. In this preliminary report consideration will be given to five groups of patients, all of whom have received the intensive course, special reference being made to the complications and reactions noted during treatment.

At the outset only untreated cases of syphilis in the first and second stages were given massive arsenotherapy. As the earlier patients tolerated the treatment so well it was decided to use the intensive method in cases in which either neoarsphenamine had been given previously and had not been well tolerated or the conditions were such that the patient was unable to follow routine treatment with weekly injections. Before starting the course the patients were carefully examined clinically and the urine investigated. On the day preceding the beginning of treatment each patient had an enema, and 300 to 500 c.cm. of glucose (6%) was given orally.

TABLE I.—*Scheme of Dosage*

Mapharside

	8 a.m.	12 noon	4 p.m.	8 p.m.
1st day	0·04 g.	0·04 g.	—	0·04 g.
2nd ,,	0·04 g.	0·04 g.	0·04 g.	0·04 g.
3rd ,,	0·04 g.	0·04 g.	0·04 g.	0·04 g.
4th ,,	0·04 g.	0·04 g.	0·04 g.	0·04 g.
5th ,,	0·04 g.	0·04 g.	0·04 g.	0·04 g.

Glucose Solution 6%

Daily for 5 days (total per day, 1,500 c.cm.):

7 a.m.	250 c.cm.	2.30–3.30 p.m.	300 c.cm.
8 a.m.	250 c.cm.	6–7 p.m.	200 c.cm.
10.30–11.30 a.m.	300 c.cm.	7–8 p.m.	200 c.cm

The total amount of mapharside administered over a period of five days was 0.76 g., but in the 83rd and subsequent cases each dose was increased to 0.06 g. on the third, fourth, and fifth days, making a total of 1 g. of the drug given during the five-day period. In the earlier cases the patients received 1,500 c.cm. daily of a 6% solution of glucose orally, and they were instructed to sip the solution over a period of one hour. When the dosage of mapharside was increased the amount of glucose was also increased to 1,800 c.cm. daily, in 6 doses of 300 c.cm. On the first day of treatment the 4 p.m. dose of mapharside was not given because this period of the day usually coincided with the time at which a Herxheimer reaction might occur. During treatment the patients were kept in bed and the urine was tested every morning and evening.

TABLE II.—*Complications and Reactions occurring in Five Groups of Patients*

Group	No. of Patients	Pyrexia	Nausea	Vomiting	Headache	Dizziness	Dermatitis	Cerebral Symptoms	Jaundice after Hospitalization	Albuminuria	Serological and Clinical Relapse
I	70	36	17	8	20	2	—	—	—	1	1
II	10	—	—	—	—	—	1	1	—	—	—
III	14	—	2	—	4	—	—	—	1	—	—
IV	1	—	—	—	—	—	1	—	—	—	—
V	5	—	—	—	—	1	—	—	—	—	—
Total	100	36	19	8	24	3	2	1	1	1	1

Results

Group 1: Primary and Secondary Cases not Previously Treated.—In 36 of the 70 cases pyrexia occurred on the first day of treatment only. Occasionally the temperature rose to 103.4° F., but in the majority of cases it lasted only from three

to five hours and did not exceed 100° F. Generally this increase in temperature caused no inconvenience to the patient and was so slight that it was recognizable only by taking hourly thermometric readings. Nausea, vomiting, and headache were experienced in those cases in which the temperature exceeded 100° F. One of the patients showed a trace of albumin in the urine on the last day of the course.

Group II.—These 10 patients had previously had one injection of neoarsphenamine at a clinic, where syphilis had been diagnosed. This group had no reactions or complication, with the exception of one patient (No. 82) who developed dermatitis and cerebral symptoms. Nevertheless, some of these patients had had a Herxheimer reaction before being admitted to this hospital.

Group III.—Five of the patients in this group were given intensive treatment with mapharside because they were intolerant to neoarsphenamine. The remaining 9 were unable to follow routine treatment with weekly injections.

Groups IV and V.—These two groups consisted of 1 patient with tertiary syphilis and 5 patients with latent syphilis.

Comments on Individual Cases

Case 7.—This patient had sero-positive primary syphilis. He differed from the other patients as he developed general lymphadenitis and exanthema macula papulosa; but recently he has been given a fresh intensive course of mapharside.

Case 13.—An initial course of neoarsphenamine was interrupted owing to dermatitis, nausea, and vomiting, and the persistence of severe headaches after each injection. On the completion of the course the patient developed jaundice. A fortnight after the jaundice had disappeared he was given a complete intensive course of mapharside without ill effects.

Case 19.—This patient had been given a course of neoarsphenamine in a V.D. clinic, but each injection was followed by severe vomiting, headache, and pyrexia. Towards the end of the course he developed a severe dermatitis with pyrexia, and was seriously ill for two weeks. After an interval of three months he was given a further injection of neoarsphenamine 0.3 g. and bismuth 0.2 g. at a V.D. clinic, but the dermatitis recurred. He came into this hospital a fortnight later and, although dermatitis still persisted, was given an intensive course of mapharside, which was completed without reactions.

Cases 35 and 96.—Both these patients were very sensitive to neoarsphenamine, and trouble occurred after each injection. One had previously had a course of mercury inunctions. This patient had slight vomiting on the first day of the intensive treatment with mapharside, but the other finished the course without reactions.

Case 63.—The first course of neoarsphenamine given at a V.D. clinic had to be interrupted several times owing to severe reactions following each injection. During treatment the patient lost weight and his condition deteriorated. A second course was started two months later, but again a severe reaction followed the first injection. He was admitted to this hospital, and the routine intensive course of mapharside was given. Slight vomiting occurred on the first day of treatment and the patient complained of headache, but he finished the course without further reactions until eight days later, when he developed jaundice.

Case 82.—The only patient amongst the series of 100 cases who had a serious reaction was Case 82, a rating aged 20 who had been exposed to infection about April 20. On May 25 he presented himself at a V.D. clinic on account of a penile ulcer of eight days' duration. *Spirochaeta pallida* was found by dark-ground illumination, and he was given neoarsphenamine 0.3 g. and bismuth 0.2 g. He reached this hospital about three hours after receiving the injections. On arrival he had a marked Herxheimer reaction. The presence of *Sp. pallida* was confirmed, and a blood test taken on May 27 showed a strongly positive Meinicke clarification reaction and a negative Wassermann. On May 29 the patient began intensive treatment with mapharside, the course being continued without reactions until the fifth day. That evening his temperature rose to 100° F., but he made no complaint and the full course was completed. On June 3 his temperature rose to 101.2° F. and he developed a morbilliform erythema. The temperature was 102° F. on June 4; during that day he complained of severe headache, and became more and more lethargic, and at times confused. At 8.30 p.m. the same evening he suddenly shrieked and exhibited strong convulsions of the clonic type which lasted about three minutes. There were no further convulsions, but he remained unconscious until 10 a.m. the following day. During the next 24 hours the condition cleared up and the temperature fell to normal. The erythema which had made its appearance on June 3 disappeared 48 hours later, but severe headaches persisted for some days. The cerebrospinal fluid, collected shortly after the convulsions, was not under marked pressure, and contained 3 cells per c.mm. and protein 160 mg. per 100 c.cm. Gold test, 0012321000. The Wassermann reaction was very weak or doubtfully positive. On June 11 protein in the spinal fluid had decreased to 60 mg. per 100 c.cm. Possibly in this case the erythema was of a type that usually appears about the ninth day after starting arsenical treatment, and toxic encephalitis combined with this form of dermatitis is occasionally seen. Concerning the reaction in this patient it should be noted that the mapharside was dissolved in distilled water, which was almost certainly contaminated owing to a leakage in the distilling apparatus.

Serological Results

Thomas and Wexler (1941) found that on an average it requires 4 to 6 months after massive arsenotherapy for the blood Wassermann test to become negative, and in some instances it may be a year or more before complete serological reversal is achieved. According to these workers the longer a patient has had syphilis the longer it takes for the Wassermann reaction to become negative, although there are exceptions to this rule.

The serological findings for the first 100 cases in this series are shown in Table III. It has been the custom in this hospital to use the Wassermann and the Meinicke clarification reactions.

TABLE III.—*Serological Results*

Group	Total No.	Wassermann Negative			Meinicke Negative			Sero-logical Relapse	Un-traced
		Before Course	Immedi-ately after Course	4 to 24 Weeks after Course	Before Course	Immedi-ately after Course	4 to 24 Weeks after Course		
I ..	70	23	16	49	14	8	29	3	6
II ..	10	7	6	9	4	3	6	—	—
III ..	14	10	11	12	8	9	10	—	—
IV ..	1	1	1	1	1	—	—	—	—
V ..	5	3	2	2	1	—	—	—	—
	100	44	36	73	28	20	45	3	6

Among the first 100 patients there were 3 serological and clinical relapses.

Discussion

Experience in this hospital has demonstrated that *Sp. pallida* disappears from the chancre in less than 24 hours after treatment with mapharside. Primary and secondary lesions heal very quickly. In no instance during treatment of these 100 cases has there been any difficulty in giving 19 injections over a period of five days. Only males have been treated, and in many cases the patients also had gonorrhoea. With one exception there have been no serious reactions, and in most cases pyrexia occurred only for a few hours on the first day. The procedure has been to dissolve the mapharside in redistilled sterile water in the proportion of 0.01 g. in 1.5 c.cm., according to the number of cases to be treated. With this intensive treatment it is necessary to have nurses who are acquainted with the procedure, and the patients should be under their constant observation.

Summary

A series of 100 cases of syphilis treated with multiple injections of mapharside is described.

The first 82 cases received 0.76 g. of mapharside within a period of five days. The remaining 18 received a total of 1 g. during this period. These injections were combined with the oral administration of glucose.

The reactions, which with few exceptions were mild, are described. Only in one case was there a serious reaction.

This series of cases is too small for any definite statement to be made regarding this method of treatment, but these results indicate that in a time of emergency massive arsenotherapy is of the utmost value, although the method is fraught with more risk than the orthodox treatment.

I wish to express my appreciation of the services of my assistant, N. Bonsaksen, and the nursing staff of the hospital.

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THREE COMMENTS ON THE PREVENTION OF STERILITY

BY

E. SCHLEYER, M.D.

The falling birth rate is giving rise to serious concern, and many committees and societies are studying its causes. Sterility is of course one important cause. Special sterility clinics have been formed for the purpose of examining and treating sterile couples, but those seeking advice are established cases of sterility, only some of which can be cured. Most investigations dealing with sterility have been concerned with its causes and treatment, but my object is to indicate the importance of its prevention. Three conditions which may lead to sterility are here discussed—namely, hypoplasia of the uterus, gonorrhoea, and chronic constipation.

Hypoplasia of the Uterus

There are two types of hypoplastic uterus. In the first of these, in which the foetal form is maintained, the cervix is longer than the fundus, the uterus is acutely ante- or retroflexed, the os is pin-point, and the tubes are usually tortuous. Owing to the persistence of a foetal condition this may be called *primary hypoplasia*, and it is due to insufficient stimulus of the gonadotrophic and ovarian hormones. Hypofunction of the thyroid may also be a causative factor. In the second type the uterus presents the adult differentiation but is smaller than normal (*secondary hypoplasia*). It develops only in adult life following amenorrhoea, severe illness, or prolonged feeding of a baby when the mother is not in good health. It is an atrophic condition of the uterus, and its main symptom is sterility.

The chief sign of primary hypoplasia is disorder of menstruation. The menses usually begin regularly but become infrequent and scanty, and finally cease. Some patients may have scanty periods at one time and profuse at another. Dysmenorrhoea is also very common in hypoplasia. Sterility usually follows, and is to be attributed to causes such as insufficiently developed endometrium or anovulatory cycles, ectopic pregnancy, or abortion.

In the adult woman primary hypoplasia is rarely curable. It is important, therefore, that the condition should be recognized in time, and proper measures taken to correct the faulty development. Any abnormalities of menstruation at puberty and during adolescence should receive serious attention, since they may be danger signals showing that development is not progressing normally (Kurzrok, 1937). Every girl who has not established a regular, normal, and relatively painless menstrual habit before the age of 15 needs inquiry into her general health and endocrine condition. The secondary form of hypoplasia might be prevented by adequate treatment of amenorrhoea and removal of the causes leading to the atrophy of the uterus.

At the present time, when thousands of girls still in their teens are engaged in war work, special attention should be given to these questions. Medical officers should be trained to recognize the early symptoms of endocrine disorders. The influence of every kind of war work on young girls should be studied. The experience of the last war showed what harmful effects improper feeding might have on young people. Spaeth (1917) and Vaerting (1918) have observed atrophy of the internal genital organs in women who, not properly nourished, were exposed to severe factory conditions. An adequate quantity of protein and vitamins is most important.

Gonorrhoea

It is well known that sterility may follow gonorrhoea, but since the discovery of the sulphonamide group of drugs the treatment of the latter has been revolutionized. Nowadays acute gonorrhoea can often be cured in a few weeks, but this advantage may be offset by the danger of overlooking slight inflammation of the Fallopian tubes, a lesion which may show no acute symptoms but may be the cause of later sterility if neglected.

The first case I observed was that of a young woman of 29 who contracted acute gonorrhoea. She underwent a course of treatment with sulphapyridine, and became negative to tests within three weeks. She was kept under observation for another two months, after which she married. Three months later she returned seeking advice because no baby was yet on the way. Examination by tubal insufflation revealed blockage of both Fallopian tubes. There was no sign of inflammation, so two weeks later I carried out another insufflation, during which the pressure, which first rose to 200 mm., suddenly dropped to 110. This suggested that the tubes had become patent, evidence for which was also provided by the fact that the patient complained of shoulder pains. Three weeks later she became pregnant. This is one of several cases in which I have found blockage of the tubes three to six months after acute gonorrhoea. It looks as if the gonococci, having lost their virulence owing to the chemical treatment, may cause only a slight inflammation of the tubes, which heal up in such a way that the walls adhere together slightly without being blocked. Under those conditions insufflation, performed in time, may prevent definite blockage and consequent sterility. King (1939) expressed the view that the sulphonamide group of drugs are not directly lethal to the organisms, but modify their metabolism so that the body defences are enabled to get the upper hand. Similar inflammatory reactions are observed in the prostatic gland after chemotherapeutic treatment (Lloyd, 1939; R. Lees, 1939). I would therefore suggest that no woman with gonorrhoea should be declared cured until the tubes have been examined. If they should be closed within three to six months after apparent cure then repeated tubal insufflation should be performed. The first insufflation should not be made before the third month and not later than the sixth month after the last negative specimen. Before performing the insufflation the following precautions should be taken: (1) the cervical secretions must have been free from gonococci for at least three months; (2) the blood sedimentation rate must be normal; (3) there should be no detectable sign of inflammation of the tubes; (4) there should be no focal or general reaction after the provocative treatment with gonococcal vaccine.

Constipation

After a special study (Schleyer, 1937, 1938) of the interrelationship between the pelvic colon and rectum and the female genital organs I reached the conclusion that inflammation of the rectum and pelvic colon may spread to the pelvic organs, leading to salpingitis and salpingo-oophoritis. One of the most common causes of proctitis and sigmoiditis is chronic constipation. Habitual disregard of the call to defaecation results in blunting of the sensation for defaecation and to accumulation of faecal masses in the rectum and sigmoid. This stagnation leads to damage of the mucous membrane and dilatation of the lower bowel, so that intestinal bacteria may invade the tissues and cause inflammation of the intestine. The anatomical situation of the lower intestine makes it possible for this inflammation to spread to neighbouring organs and thus cause salpingitis. Salpingitis often ends in sterility. Prevention of constipation and proper treatment of procto-sigmoiditis may thus be important factors in the prevention of sterility.

Summary

Sterility is an important cause of the falling birth rate. Once established it is difficult to cure, but prevention is sometimes possible. Three conditions are described which may lead to sterility—hypoplasia, acute gonorrhoea, and chronic constipation. Timely treatment of each of these might lessen the danger of subsequent sterility.

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Medical Memoranda

Haemothorax due to Strangulated Diaphragmatic Hernia

Haemothorax as the predominant clinical sign following acute strangulation of a diaphragmatic hernia is unusual enough to warrant record.

CASE HISTORY

The patient, a farm labourer aged 37, gave a history of previous good health, although he had complained to his family of occasional indigestion. On Jan. 14, 1942, he felt severe abdominal pain immediately after supper. He was seen by one of us (S. M. S.), who found him shocked and restless, with temperature 97°, pulse 100, and respirations 20. There was tenderness on deep palpation below the left costal margin but no rigidity. Dullness with diminished air entry was found at the left base, suggesting effusion. He was neither dyspnoeic nor cyanosed. He had been sick once, the vomit appearing normal.

He was admitted to Evesham Hospital on Jan. 15, and at 11 a.m., because the physical signs indicated a rapid increase in the amount of fluid and his condition was deteriorating, an exploratory needle was introduced into the fifth space in the left mid-axillary line, and 10 c.cm. of normal-looking venous blood was withdrawn. A radiograph of the chest revealed that the heart and mediastinum were well over to the right, and there was a dense uniform opacity over the whole of the left lung field. When seen by another of us (S. D.) on the 16th the patient was orthopnoeic and had begun to vomit a little blood. The physical signs all pointed to the thorax: abdominal examination did not suggest anything abnormal there. 27 c.cm. of apparently normal venous blood was then removed from the chest. A second radiograph taken immediately after this showed that the heart and mediastinum were still over to the right; no fluid was now apparent on the left side, although there was diminished translucency. In the upper part of the left lung-field could be seen what appeared to be a loop of intestine, and irregular opacities were noted immediately above the left diaphragm. The left lung was collapsed against the mediastinum. At this stage the patient was seen by Dr. Haslett of Cheltenham, who diagnosed a ruptured diaphragmatic hernia. The patient's general condition deteriorated rapidly, the respiration rate rose although the vomiting became less frequent, and he died in the early hours of Jan. 16.

Necropsy.—This was performed 36 hours after death. On opening the chest it was noticed that the left lung was collapsed. This collapse was old-standing. The pleural cavity was occupied by a mass of blood clot and what turned out to be omentum. In addition there was a loop of gangrenous stomach which had herniated through the diaphragm with a portion of omentum. The right lung showed oedema of the base and a little emphysema at the apex. The hernial orifice was well up towards the mesial attachment of the muscle in the oesophageal opening. The herniated portion of the stomach was in the form of a well-marked diverticulum. No gross ulceration of vessels could be found in the stomach wall, and there is little doubt that there had been a generalized oozing from the strangulated portion of the stomach and omentum. Histologically the mucous membrane of the stomach was necrotic, but there was a distinction between the abdominal and thoracic portions, the glandular structure being preserved in the former, although nuclear staining was imperfect, while in the latter the mucosa had virtually gone, the whole appearance being one of necrosis with extravasated blood extending throughout the wall. At the point of strangulation there was considerable fibrosis of the stomach wall. Sections through the neck of the strangulated portion of the omentum (which weighed 148 g.) showed arteries and veins to be distended with blood clot; in some instances organization had started, but the nuclei of the adipose cells had disappeared, as had also an appreciable proportion of the cells of the vessel walls. There was diapedesis through the damaged vessels, and altered blood pigment was found in the adipose-tissue spaces.

DISCUSSION

We have been unable to find a parallel case in the literature. Blood in the pleural cavity was noted, but only as a fortuitous finding by Alderson (1858), Boysen (1921), Schaper (1925), and Collier, Hurst, and Sheaf (1929). In our case the haemothorax was presumably due to a diffuse oozing from the gangrenous mesentery and incarcerated portion of the stomach, but one or more vessels of larger calibre may have contributed towards the haemorrhage. In this connexion Knaggs (1904) stated: "The ulceration that occurs in strangulation of the stomach seems to be different from ulceration in strangulation of the intestine. In the latter it begins on the mucous membrane surface and extends to the outer coats. In the case of the stomach the available evidence points to extreme distension producing splits through the peritoneal and muscular coats, perforation being staved off for a time by the integrity of the sodden and rotten mucous membrane. Further, ulceration does not appear to have been noted at the seat of constriction, the most common place for it in the intestine."

Jankelson and Morein (1940) have enumerated the pre-operative and post-operative complications of diaphragmatic hernia. Anaemia, they claim, is frequent, and is due to repeated small haemorrhages or oozing from congestion or erosions of the mucous membrane of the lower oesophagus or stomach. Profuse haemorrhages originating from multiple fissures in the constricted portion of the stomach have been observed gastroscopically by Jankelson. Other complications are rupture of oesophageal varices, oesophageal or gastric ulceration, diverticulation, and carcinoma. In addition, volvulus would appear to be a not infrequent cause of incarceration, and in our case torsion of the herniated portion of stomach and mesentery may have contributed to the fatality.

The victims of diaphragmatic herniation thus go through life with many potential dangers threatening them, and it is pertinent to ask if, when discovered by routine examination (and by mass radiography!), they are to be subjected to surgical operation for repair. Our patient's congenital weakness of the diaphragm might have been disclosed earlier had his dyspepsia been investigated radiologically, but his symptoms were of so slight a degree as not to cause him to seek medical advice.

S. DEANER, M.R.C.S.,
Tuberculosis Officer, Worcestershire.
W. H. MCMENEMEY, D.M.,
Pathologist, Worcester Royal Infirmary.
S. M. SMITH, M.B., B.Ch.,
Hon. Physician, Evesham Hospital.

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Pfeiffer's Bacillus Meningitis: Recovery after Sulphapyridine

Before sulphonamide therapy, meningitis due to Pfeiffer's bacillus had a very high mortality rate, especially in children. Aleman (1940) collected records of 478 cases in infants aged 2 years or under. The mortality rate was 97%. Sulphanilamide only slightly improved the figures—82 cases, with 87.8% mortality (Aleman, 1940). But sulphapyridine has given much better results, and Mitchell (1941) found records of 33 patients who recovered after treatment with it: 16 of them had received specific serum also, and 10 of the 33 were aged 30 months or less.

The following brief report shows certain interesting features of a case treated with sulphapyridine: (1) the ease with which a high sulphapyridine level in the C.S.F. was obtained; (2) the high degree of tolerance of the drug; (3) the relapsing of meningitis.

CASE RECORD

A boy aged 3 was playing in the garden on the morning of May 28, 1942, and ate his dinner normally. In the late afternoon he was found in convulsions in his pram. He had never been ill before and was an only child. Both parents were healthy. When seen he was almost comatose, and was twitching constantly. Apart from slight neck rigidity, physical examination was negative. The C.S.F. was turbid and contained many polymorphs. Sulphapyridine was started. Phenobarbitone soluble, gr. 1/2 by injection, was necessary to control the fits. Next day Pfeiffer's bacillus was grown in the C.S.F. The sulphapyridine dosage was 4 g. in 24 hours—one 0.5 g. tablet every 3 hours.

After 48 hours the temperature, which was 102.4° F. on admission, reached normal, and he seemed quite well apart from some neck stiffness. On the third day the C.S.F. still showed Pfeiffer's bacilli on culture and 8 mg. of sulphapyridine per 100 c.cm. The drug was continued. Next day only one colony was grown from the C.S.F., in which the sulphapyridine level was 11 mg. per 100 c.cm. Neck rigidity remained and sulphapyridine was continued for 8½ days, the C.S.F. level on the last day being 5.8 mg. The total dosage was 23.75 g. A blood count on the fifth day showed 4,000,000 red cells, 76% Hb, and 14,500 white cells, of which 70% were polymorphs. On the ninth day the C.S.F. was turbid but sterile, and contained 65 cells per c.mm. (50% polymorphs and 50% lymphocytes) and 40 mg. of protein per 100 c.cm. He was discharged on the sixteenth day, having been clinically normal for 6 days.

Next day he was brought back with neck rigidity and a temperature of 101.4° F. The C.S.F. was turbid, and contained 2,600 cells per c.mm. (50% polymorphs and 50% lymphocytes); its total protein was 70 mg. per 100 c.cm., and it was sterile on culture. He was given another course of sulphapyridine, the total dosage being 10 g. in 3½ days. His temperature was normal the following day and has remained so. 20 days after the initial onset the C.S.F. was clear and colourless and contained 25 cells per c.mm. (90% lymphocytes); total protein 25 mg. per 100 c.cm., chlorides 760 mg.; sterile on culture. He was then quite normal and has continued so. There was no evidence at any time of sinusitis, otitis, or upper respiratory infection. No vomiting occurred throughout the illness.

C. ALLAN BIRCH, M.D., M.R.C.P., D.C.H., D.P.H.,
Physician, Chase Farm Hospital, Enfield.

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Reviews

TREATMENT OF WOUNDS AND FRACTURES

Wounds and Fractures. A Clinical Guide to Civil and Military Practice. By H. Winnett Orr, M.D., F.A.C.S. (Pp. 227; illustrated. 27s. 6d.) London: Baillière, Tindall and Cox.

The Winnett Orr method is now firmly established in surgical practice in the treatment of chronic osteomyelitis and infected compound fractures. The author of the method has been preaching and practising his principles since the last war, but it is only during the last ten or fifteen years that the method has been widely tested and proved. The two essentials in treatment are that effective immobilization of the limb must not be prejudiced by the presence of an open discharging wound and that meddlesome interference with the wound should be avoided by the "no dressings" technique of the closed plaster.

The first section of the book deals with these fundamental principles of the Winnett Orr method and describes in detail the technique of its application. In the treatment of compound fractures a wound excision is performed in the usual manner, the fracture is reduced accurately on a fracture table, and a plaster cast is applied. Two pins, one above and one below the fracture, are incorporated in the plaster to obtain complete immobilization of the fragments, and vaseline gauze is used to dress the wound. The plaster is closed and there need be no interference to inspect and dress the wound unless pain, swelling, or a raised temperature occurs. The author stresses the importance of a thorough preliminary excision; and in the case of wounds already infected and in osteomyelitis adequate drainage must be ensured by the operation before the closed plaster is applied.

The succeeding chapters deal with special problems in fracture treatment which illustrate the application of the Winnett Orr method. Fixed skeletal traction by means of two or more pins figures prominently in the cases illustrated, but wiring and plating of the fracture itself is not advised. No attempt is made to deal systematically with the whole field of fracture treatment, and the cases are chosen largely for their value in illustrating the principles which the author seeks to emphasize. The book is written in a dogmatic fashion, and some of the statements made would be better if they had been qualified in some way. For instance, in the very short section on fractures of the spine it is stated that if the fracture is reduced at once in anatomical position "symptoms of cord injury may be expected to disappear at once." Surely even the Winnett Orr method cannot do this.

The book is well produced and illustrated by a large number of photographs and *x*-ray pictures. Each of the chapters is written round a small collection of selected clinical cases chosen to illustrate views expressed, and this makes the book very practical and readable.

THE LABORATORY RAT

The Rat in Laboratory Investigations. By a staff of Thirty Contributors. Edited by John Q. Griffith, jun., M.D., and Edmond J. Farris, Ph.D. (Pp. 488; illustrated. 45s.) Philadelphia, Montreal, and London: J. B. Lippincott. 1942.

This book deals fully with the rat and its behaviour under normal conditions and under all types of laboratory experimentation to which it has yet been subjected. Probably no other animal has been used in such large numbers or for such a variety of purposes, which is chiefly due to its size and ease of handling, its readiness to eat nearly anything (but in quantity only sufficient to satisfy its hunger), and its speed in reproduction. The editors of this book even claim that the rat "can be readily standardized," which suggests that rats can be expected to respond in equal degree to the same treatment. This is far from the truth; the variation between individuals, even within the same litter, is always large and sometimes appallingly so. Hence large groups of rats are used and comparisons drawn from average results whose reliability may be estimated statistically.

The different chapters in this book have been written by different specialists. They deal with breeding of the rat (and housing, etc.), general methods (of handling for injection, etc.), gross anatomy, experimental methods and rat embryos, dietary requirements, teeth, digestive system, metabolism, central nervous system, techniques for the investigation of psychological phenomena, circulatory system, use of the rat in biological assay of hormones, doses of drugs for rats, haematology of the rat (methods and standards), radiological considerations, surgery of the rat (23 operations), histological methods adapted for rat tissues, the osseous system, the eye of the albino rat, protozoan parasites of the rat, metazoan parasites of the rat, spontaneous diseases of laboratory rats. Each chapter has its own bibliography, and there is a good index; the book contains 1,863 references (unfortunately those for the chapter on the digestive system (1–11) are missing). The diagrams, photographs, and *x*-ray plates are excellent. All experimenters who work on rats will wish to have access to this book and will find in it much of interest on their own subject and much that will be enlightening on subjects of other workers.

PHYSIOLOGY FOR MEDICAL STUDENTS

Handbook of Physiology and Biochemistry. By the late W. D. Halliburton, M.D., LL.D., F.R.C.P., F.R.S., and R. J. S. McDowall, M.D., D.Sc., F.R.C.P.Ed. 37th edition. (Pp. 977; illustrated. 21s.) London: John Murray.

As indicated by the author and on the cover, this book is primarily and essentially meant for the use of medical students. Consequently it could not be expected to be deep or exhaustive in any senses of these terms, and, in fact, it is not. It would be expected to be as clear as possible and as accurate as its brevity would allow, and for the most part these merits must be conceded, though in places it bears marks of slipshod handling. This is perhaps to be attributed to the acknowledged impossibility of any one man being a master of the whole subject, though it often seems that the hapless student is expected to have such knowledge. However, the student's object is to pass his examination, and the author's to put him wise to the task. The long-continued success of this work as a student's book is proof enough that mutual satisfaction has been reached. In future editions it may be worth the author's while to alter Figs. 101 and 104, which depict neurones without cell bodies—a dangerous seed to sow in the mind of a candidate—and we would be glad to see Fig. 197 a little modified too. The index is helpful and complete and the paper and general get-up are of the best.

Notes on Books

To mark the bicentennial conference of the University of Pennsylvania, the University Press have published a pamphlet on *Problems of Intestinal Obstruction* (Philadelphia: University of Pennsylvania Press; London: Oxford University Press, 1941, pp. 56; 3s. 6d.). It consists of four papers: the first, on electrolyte balances in the obstruction of the gastro-intestinal tract, is by Dr. J. P. Peters, the John Slade Sly Professor of Internal Medicine at Yale. The next, on distension in intestinal obstruction, is by Owen H. Wangensteen, the second edition of whose book on intestinal obstruction we recently reviewed (1942, **2**, 696). Decompression of the intestinal tract is discussed by W. O. Abbott of the University of Pennsylvania, while A. O. Whipple and J. A. Nelson are joint authors of the last paper on the end-results of decompression of the intestinal tract with and without operation. Such problems as transperitoneal absorption, the systemic effects of obstruction, and the effects on the intestinal wall of sustained distension are considered. Expressions like "scout radiographs of the abdomen" (Section III, p. 31) are perhaps rather unusual to us, but how much more graphic is this one than the straight or plain "*x*-ray" which we have been accustomed to ask for? Most abdominal surgeons will value this little book. It is unfortunate that its attractive appearance in clear type on matt paper is marred by the fact that the pages have been put together in wrong order. This should obviously be corrected if, as we hope, a reprint is called for.

The National Baby Welfare Council has just published a leaflet, "The Stammering Child and How He can be Helped," priced at 2d. per copy or 1s. 9d. a dozen. Another of the Council's leaflets, "Should we have a Baby in Wartime?" is sold at 2s. per hundred copies. Orders for both leaflets should be sent to the N.B.W.C., 29, Gordon Square, London, W.C.1.

Nova et Vetera

BODIES FOR DISSECTION IN DUBLIN IN 1818

We are indebted to Dr. W. B. Heywood of Newbury for the sight of an interesting letter written in beautiful handwriting by Dr. John Cheyne (1776-1836) to Dr. Edward Percival, son of Thomas Percival, the Manchester physician and author whose *Medical Ethics* is still a book well known in professional libraries. John Cheyne was one of the founders of the Dublin School of Medicine and his name is linked with that of William Stokes in "Cheyne-Stokes respiration." The letter, written from his house in Merrion Square, Dublin, on Dec. 2, 1818, is too long to quote in full. It is largely concerned with the morbid appearances in cases of fever during one of the frequent epidemics. Discussing the post-mortem findings Dr. Cheyne writes:

"From Macartney's habits of careful observation, I receive his statements with confidence, but I cannot help objecting to the source from which he derives his information, which he says was obtained from an examination of the subjects who were brought into his Theatre with Petechiae on the surface. By the way Petechiae were as rare in the winter as they were common in the summer and autumn, and some kinds of Petechiae can scarcely be distinguished from flea bites. But as the mortality among the poor during the winter was chiefly caused by the Epidemic I am willing to allow that these subjects were really victims of fever. But still I allege that they were not calculated to afford a fair representation of the havock of that disease on the human frame, and the process of disinterment, when explained, will show that my objection is not frivolous.

"The Bodies used in most of the dissecting rooms are derived from the great cemetery for the poor called the Hospital Fields—vulgo Bullys Acre; these, there being no regular resurrection men, are procured by the pupils who, fixing upon a grave, are influenced by the appearance of fresh earth scattered around it, by the freshness of the sods if there are any, and by the looseness of the substratum of soil, which is probed by a pointed iron instrument called 'a poker.' But notwithstanding great enterprize and exertion and disregard of danger which sometimes is also great, the work being done by amateurs, and not by regular members of this part of the profession, disappointments ensued, and the subjects raised were often in an advanced stage of putrefaction and certainly the dissecting rooms are often supplied with bodies which have been under ground for a fortnight or three weeks. In the work of exhumation the upper part of the grave is cleared, the corresponding part of the lid of the coffin is torn up, and then by means of a noose round its neck the body is extracted by main force. The bodies tied up in a sack, neck and heels, are subject to great violence during their transport from the Burying ground—as for example, they are dropt from a high wall, by which as is well known fractures of the cervical vertebra not unfrequently occur. To conclude, the cadaver is roughly handled in the dissecting room, being often left with the head hanging over the table, by which means the blood gravitates and *congestion* of the brain to a great extent is the consequence. With regard to the colour of the intestines I rather think, when putrefaction is advanced, extravasation takes place and a more uniform dark colour than natural. From the foregoing account which is not exaggerated it may be affirmed that the condition of the capillary system cannot well be learnt from an examination of the bodies which are usually brought into a public dissecting room.

"As to our own proceedings at the House of Industry from which conclusions so different have been drawn. The body is removed to a deadroom in a coffin—the dissection is made in almost every instance within 24 hours after the patient's death and the particulars of the dissection are committed to writing as a sequel to the case which generally is regularly reported."

HISTORY OF BLOOD TRANSFUSION

A note on the history of blood transfusion by Eric L. Cooper (*Austral. New Zeal. J. Surg.*, 1941, **11**, 84) reminds us that it is not a modern innovation. In 1490 three small boys gave their blood, at the rate of 10s. a head, to Pope Innocent VIII. All three donors died, but whether their blood was actually transfused is doubtful, Dr. Cooper believing that the patient probably drank a mixture containing blood and stimulants. In 1615 Andreas Libavius, and in 1653 Robert des Gabets, a monk of Cluny, described procedures for blood transfusion. In 1657 Christopher Wren and Robert Boyle tried the effect of injecting various substances into the veins of animals. Then, in 1665, Richard Lower, at Oxford, successfully transfused blood from one animal to another by joining the vertebral artery of the donor to the jugular vein of the recipient. Jean Baptiste Denys, in Paris, is said to have been the first to transfuse blood into a man when, in 1666, he injected 9 oz. of lamb's blood into the veins of a youth suffering from a prolonged fever. A year later Richard Lower transfused the blood of a lamb into a Mr. Arthur Coga, with the result that he "kept back impending insanity." After his fourth patient to be transfused had died as the result of an incompatible transfusion, Denys was charged with murder, but was acquitted, the Parlement of Paris forbidding further experiments on human beings. A Papal Edict in 1675 forbade the further transfusion of blood. Work on blood transfusion then had a setback for a hundred years, and towards the end of the eighteenth century interest was revived by, among others, Erasmus Darwin, the grandfather of Charles Darwin. Matters were carried much further by the eccentric James Blundell, who was obstetrician and anatomist at Guy's and St. Thomas's. In 1818 he invented a syringe with a three-way tap for direct transfusion. It is interesting to recall that in 1857 Higginson performed seven successful transfusions with the syringe which still bears his name. Virchow and Bischoff, in 1835, had used defibrinated blood, and this was subsequently also used at Bart's in 1873 by Thomas Smith. Attempts were made to delay clotting by adding ammonium sulphite in 1867 and sodium phosphate in 1868. A turning-point in the history of transfusion was the introduction of paraffin-coated transfusion apparatus. Then, in 1915, citrated blood was used for the first time. Apart from the prevention of clotting, the other essential step to make blood transfusion safe was taken when Landsteiner, and also Shattock, in 1900 demonstrated the presence in the blood of iso-agglutinins and established three blood groups, to which a fourth was subsequently added.

TWO PIONEERS OF AMERICAN MEDICINE

Doctor Bard of Hyde Park: The Famous Physician of Revolutionary Times, the Man who Saved Washington's Life. By John Brett Langstaff. Introduction by Nicholas Murray Butler. (Pp. 365. $3.75.) New York: E. P. Dutton & Co., Inc. (302, Fourth Avenue, New York, N.Y.).

There were two Dr. Bards—John the father and Sam the son—both of them outstanding men of their time; and while this volume chiefly deals with the latter, there runs through it a constant reference to Dr. John Bard, the father, who set himself to elevate the medical profession in America. He founded the American Medical Society and became first Health Officer of New York. In the eighteenth century quack doctors, who were his pet aversion, "abounded like locusts in Egypt: they were mere pretenders to a profession of which they were entirely ignorant." Dr. John Bard, born in 1716, lived 83 years, and was proud of the achievements of his son Dr. Sam Bard, who is the subject of this biography.

In 1761 Sam embarked for England. On reaching London he studied anatomy under William Hunter and then went north to Edinburgh, where he became a distinguished student and medallist, graduating in 1765 and returning to New York a year later. During these years the father's enthusiasm was a constant spur to his son's activities. When Sam came back his father handed over his practice, the foremost in the city, and retired to the family estate of Hyde Park. The next 40 years were for Dr. Sam Bard full of social, cultural, and political activities, but he ever kept the advancement of scientific medicine in the forefront; he even found time for study and the writing of books and monographs. He lived in the stirring historical period of the American Revolution and the Declaration of Independence. He worked hard to found the New York Medical School (Columbia University), which four years later had the distinction of granting the first American degree of M.D. He organized other scientific societies, founded a State medical library, and inaugurated the New York Hospital.

Sam Bard was the Osler of his day, and the same could be said of his father. The author, Mr. Brett Langstaff, spent six years of research in compiling the biography of these two eminent eighteenth century doctors. American readers will find this book intensely interesting: British readers also will enjoy its quaint lore and historical accuracy. The book is a model of how a medical biography should be written.

C. J. Brim (*Arch. Derm. Syph.*, Chicago, 1942, **45**, 371) suggests that Job's illness, which has been variously identified with syphilis, leprosy, and other skin conditions, was really pellagra, and draws attention to the similarity of the symptoms in Job's case with that of a typical example of the disease.

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TREATMENT OF MALARIA UNDER WAR CONDITIONS

With the Allied armies operating in many tropical and subtropical malarious countries and the certainty that men from these armies will return infected to this country, not to mention other sources of malarial infection brought about by the war, it may be taken as certain that many medical men who have never had anything so far to do with malaria will find themselves called upon both to diagnose and to treat this disease. To make things more difficult, the old and familiar quinine salts so long used in this connexion will, from lack of adequate supplies, almost certainly under present conditions have largely to give place to treatment by new and unfamiliar synthetic compounds. Ideas of treatment, too, have changed a good deal lately, and drug prophylaxis has assumed an importance which it never before had. Yet, all things considered, the treatment of malaria in recent years has become much simplified. Indeed, treatment and prophylaxis of malaria are in practice by no means so complicated as the mass of detail in the literature might lead the beginner to suppose. In relation to the war there are short helpful pamphlets issued by the War Office[1] and the Ministry of Shipping[2] relating to Army treatment and malaria among seamen respectively. Recently a paper read before the Royal Society of Tropical Medicine and Hygiene by Sir Rickard Christophers,[3] the President, has dealt with the elements of treatment in special relation to the use of the new synthetic drugs. We may note also a paper read at the same meeting by Major T. Rowland Hill, R.A.M.C., dealing with malignant tertian (*falciparum*) malaria among troops engaged in military operations.[4]

What, then, are the chief points the beginner should know? In the first place it is necessary to distinguish between treatment of an attack of malaria and so-called prophylaxis or, more correctly, drug prophylaxis. The only drug for both treatment and prophylaxis, apart from quinine, is the synthetic drug mepacrine (the pharmacopoeial name for atebrin). This is the only completely satisfactory substitute that will in practice be available. Mepacrine is a British-manufactured drug. It is made available in two forms—namely, the drug as ordinarily used in small tablets of 0.1 gramme, and as an extra-soluble form in ampoules for injection. Mepacrine is not to be regarded as a mere second-best substitute for quinine. It is a drug as potent as, if not more so than, quinine, and it is one that can be used safely and even with some advantages over quinine. In all cases in which there is no serious reason to the contrary, both with quinine and with mepacrine, administration should be by the oral route. Another British-manufactured drug, pamaquin (the pharmacopoeial name for plasmoquin), is likely also to be available, but it is not a substitute for mepacrine or for quinine and is now not used alone either in treatment of the acute attack or in prophylaxis. It is thought by many to aid treatment by reducing the liability to relapse or to be an adjuvant in after-treatment and prophylaxis. This need not unduly concern the beginner, for it cannot be said that pamaquin is a necessary drug in the sense that mepacrine is, and its use can be left to be decided upon as experience may suggest. Pamaquin is much more toxic than mepacrine, and is used in doses not exceeding 0.02 gramme often combined with quinine (quinoplasmin, etc.). It should not be given at the same time as mepacrine but may follow or alternate with this. The curative dose of mepacrine—i.e., the dose used in treatment of an attack of malaria (we refer only to the adult dosage)—is 0.3 gramme taken in three spaced doses (three 0.1-gramme tablets) a day, preferably after food (or with milk), as there is a slight tendency to minor gastro-intestinal symptoms. Usually after a mild purgative this dosage is begun early and continued for seven days. If the fever has not subsided by the end of this period it is to be suspected that some other condition than malaria is present. The reasons why administration is not continued in any one course for a longer period than seven days are (1) that it is not necessary, and (2) that mepacrine has a rather marked cumulative effect. There is no objection, however, to a repetition of such a course after an interval, say, of a week's time.

This simple procedure constitutes the essentials of the treatment of a malaria attack—namely, the temporary destruction of the parasites. It is very doubtful whether with either mepacrine or quinine more prolonged treatment at this time will effect any more complete destruction, and one must trust ordinarily to treating as a further attack any relapse which may subsequently develop, though something may be done in the way of after-treatment to reduce the chances of this. Much attention has been given to methods of reducing liability to relapse by after-treatment. But without invaliding to the base or home it is not very probable that in war conditions much more than treatment of attacks as they occur and the usual prophylactic dosage can be carried out in the field. Quinine is sometimes used to start a treatment by mepacrine, and many modifications have been recommended by different authors, but these again are a matter for personal predilection and experience. One consideration in treatment is very important and requires constant vigilance and prompt action: this is, when dealing with *falciparum* infection, to anticipate the onset of coma or other pernicious manifestation indicating serious danger of death. *Falciparum* infection, or so-called malignant tertian, is the common malarial infection contracted by Europeans in the Tropics. In spite of the name attacks are not necessarily severe, but the parasite has the property not possessed by any other malarial parasite of giving rise, often rather suddenly or insidiously, to pernicious manifestations the normal end of which, unless promptly countered, would be death. The indication in such an event is to get the specific drug at all costs at once into the circulation, and it is usually taught that an immediate injection should be given intravenously, this being the quickest known route of administration. Intramuscular injection is also recommended by some authorities, but in the case of quinine there is a divergence of opinion. With mepacrine the local necrotic effects produced by the quinine salts usually used appear to be absent, and intramuscular injection, which need not be into the gluteal region, has been widely employed and apparently without objectionable effects. If intravenous injection is difficult, intramuscular administration of mepacrine may therefore be substituted, but intravenous injection is perhaps more rational and better practice. The precaution should be taken to inject slowly.

The usual prophylactic dose of mepacrine is 0.2 gramme (two 0.1-g. tablets) a day, given on two successive days each week. This is roughly the equivalent of the usual 5 grains of quinine daily. As pointed out by Major Rowland Hill

[1] War Office: Notes on Treatment of Malaria in Individuals Returning from Malarious Areas. H.M.S.O., 1941, London.
[2] Ministry of Shipping: Malaria among Merchant Seamen. Memorandum for the Use of Ships' Surgeons. Notice 195, 1940, London. Also Notice No. 178 drawn up for captains of ships and laymen.
[3] *Trans. roy. Soc. trop. Med. Hyg.*, 1942, **36**, 49; and discussion, p. 66.
[4] Ibid., p. 75.

in the paper referred to above, malaria has often decided the course of a campaign, and the only practicable way to prevent malaria where troops are operating in the face of the enemy is drug prophylaxis. It is therefore vital that this should be appreciated by all, including the ranks themselves. In our present armies the intelligence of the private soldier is high, and his education and instruction in self-protection should be more effective in bringing about the desired result than reliance solely on the old and very imperfect mechanism of the quinine parade. Mepacrine in certain amount produces a yellow coloration of the skin. This is quite harmless and merely due to the colour of the dye. It is in no way related to jaundice, nor is it evidence of constitutional disturbance. Some harmless temporary yellow coloration, even if it affected every individual in the Force, would be a small price to pay for immunity to malarial attack and success of a campaign which might otherwise have failed.

AGAINST TETANUS

Passive immunization of the wounded man with tetanus antitoxin served us well in the war of 1914-18. This method is still current in the German-controlled areas, but in most of the Allied armies active immunization is now the custom. The technique of active immunization is not yet uniform. British authorities and the American Army use formol-toxoid; the American Navy favours tetanus alum-toxoid, which has remarkably high immunizing potency. All give at least two injections about a month apart. In the English Army immunization is voluntary. Most armies practise re-immunization, and it is understood that the British give further injections at intervals. The Americans re-stimulate with a third dose of toxoid after six months or before embarkation or entry into active fighting, and periodically thereafter. Practice also differs somewhat when the wounded soldier first comes under medical care. The British give a prophylactic injection of tetanus antitoxin to all accessible wounded irrespective of previous immunization. The Americans and Canadians trust to the rapid increase of immunity after an "emergency stimulating immunization" with an extra dose of toxoid, reserving antitoxin for the treatment of clinical tetanus.

To what degree are our men protected against tetanus? The experience of the B.E.F. in Flanders and France was suggestive. The published figures show that some 80 to 90% of about a quarter of a million men had received immunizing injections of tetanus toxoid. Among the 10 to 20% not immunized, 8 cases of tetanus occurred during the Dunkirk period; there were no cases among the immunized. As no method of active immunization gives absolute protection against the highest possible risk, it is reasonable to expect an occasional case of tetanus in the present heavy fighting, and, according to Col. Boyd,[1] cases have occurred. His paper will be studied with much interest. The outstanding points are clear. Tetanus is rare in the Middle East fighting zone, but the risk is there, for in wound swabs from 494 soldiers not suffering from tetanus 2 cultures of tetanus bacilli were found. Among large forces from the United Kingdom, India, and New Zealand, who were the most highly immunized, the incidence of tetanus was 0.13 per 1,000 wounded; among the South African Forces, among whom immunization was not in vogue in the early part of the war, the incidence was 1.6. The figures are small—11 British cases with 4 deaths, and 7 prisoners of war with 5 deaths—but, analysed in every way, they "afford evidence of the value of inoculation," though 5 actively immunized men suffered and 3 died. None of the 5 had, on being wounded, received the prescribed dose of prophylactic antitoxin. There was no convincing evidence for or against the utility of chemotherapy.

We do not know what precisely is the complex relation in the immunized animal between the toxin of the developing tetanus bacillus on the one hand and the antitoxin-producing cells and the highly receptive local nerves on the other. It is easier to understand what happens in the unimmunized animal when in the laboratory toxin is injected into the tissues. The dose of toxin is limited and is not being added to continuously by fresh toxin made by the living bacillus. If the animal thus injected with diphtheria or tetanus toxin has in its blood sufficient antitoxin to overwhelm and neutralize the whole of the toxin, it does not suffer any ill effect. But if it has no antitoxin or an insufficient amount, the toxin at once attacks or is absorbed by the cells susceptible to it. We know from the timed-Schick-test experiments of Glenny and Hopkins[2] in guinea-pigs that some of the toxin is attached to the cells in thirty minutes, for no amount of antitoxin after that time will prevent some small reaction in the skin. After three to six hours all the toxin is absorbed by the susceptible cells, for even a large excess of antitoxin injected intravenously will not avert the appearance in due course of a full-sized Schick-positive reaction. Similarly, if a fatal dose is injected subcutaneously it is all absorbed within eight to twelve hours, and death will occur despite huge amounts of antitoxin injected intravenously.

In the immunized animal conditions are more complex. Zuger[3] and his co-workers have studied what happens when tetanus spores and irritant are, later, injected. They protected guinea-pigs by two spaced doses of tetanus alum-toxoid. After intervals of some months they injected a lethal mixture of tetanus spores into immunized animals. The group of animals thus treated possessed considerable immunity, for only 17 of 76 showed symptoms of tetanus, though the dose of spores was sufficient to kill all of 20 unimmunized control guinea-pigs. Into 75 immunized guinea-pigs there was injected an additional dose of tetanus toxoid at the same time as the tetanus spores; the effect of the additional toxoid was apparently to reduce the incidence of tetanus, for only 8 of the 75 developed local, non-lethal tetanus. In the immunized animal infected with tetanus spores, toxin may be formed slowly or rapidly, depending on the amount of injured or necrosed tissue and on the intensity of infection. If it develops slowly, as it presumably did in Zuger's experiments (for 64% of his animals did not develop rigidity until the seventh day), the production of antitoxin by the appropriate cells, trained to their work by the original immunization, may be moderate or great. An additional dose of immunizing toxoid given at the time of infection or wounding apparently much hastens and magnifies the production of antitoxin, but this process may not operate quickly enough to overwhelm toxin generated immediately after the injury. In Boyd's apt phrase, the toxin outpaces the antitoxin. Zuger's results and Boyd's cases are consistent with the deduction we can draw from the earlier experimental work. This strongly indicates that the fate of the infected immunized animal depends primarily on the amount of antitoxin ready formed and present in the circulation at the time of infection. This antitoxin is ready to seize on and neutralize the first toxin produced.

Experience of passive immunization in the American Fourth-of-July tetanus campaign and in the war of 1914-18 indicates that a dose of 500 to 1,500 units of tetanus antitoxin (=1,000 to 3,000 international units) gives high protection against tetanus. After this quantity the blood shows

[1] *Lancet*, 1942, **2**, 745.

[2] *J. Path. Bact.*, 1925, **28**, 2611.

[3] *J. Immunol.*, 1942, **44**, 309.

an early concentration of about 0.1 to 0.2 unit per c.cm. This titre has been aimed at by many investigators of active immunization, though figures ranging from 0.01 (Boyd[4]) to 5.0 (Peshkin[5]) are found in the literature. Evans[6] found that most of his adults four months after immunization against tetanus had more than 0.01 unit per c.cm., and Marvell and Parish[7] found 0.1 unit or more in 40 of 61 people bled about six weeks after two spaced doses of tetanus toxoid. The immunologist would expect titres of this kind to confer solid protection. Yet Zuger's figures make us pause. Of 49 immunized guinea-pigs with more than 5 units at the time of injection of spores, one which received no additional toxoid developed general tetanus and 4 suffered from local tetanus. For further evidence we must await further experience. Meanwhile two clear conclusions emerge. We must aim at the highest possible concentration of tetanus antitoxin in the blood of every soldier exposed to risk; this can be attained by periodical re-stimulation with tetanus toxoid of all soldiers; the argument for giving prophylactic antitoxin to wounded men seems at present cogent. With regard to surgery, Boyd, like all with experience, stresses the paramount call for immediate and adequate surgical attention to damaged or necrosed tissues. Naturally, these same lines of argument are in general applicable to gas gangrene.

COLLAPSE AND BRONCHIECTASIS

The finding of bronchiectasis in association with pulmonary collapse has given rise to much speculation on the nature of the relation between these two conditions. Tannenburg and Pinner[8] have produced collapse of a lung in rabbits both by means of a rigid bronchial plug and by bronchial ligation, and they have studied the condition of the bronchi in lungs so collapsed. They found that the first change after the bronchus had been blocked was rapid deflation of the lung owing to absorption of its contained air. This phenomenon was first demonstrated by Lictheim[9] in 1879, and it is interesting that Tannenberg and Pinner found that the lung could become completely collapsed in less than 20 minutes. The bronchi took part in this process and were at first constricted. In the absence of infection the lung could remain in this condition for many weeks, but in most animals the bronchi in the collapsed lung were found at necropsy to be dilated and full of muco-purulent secretion. Sections of the bronchial walls showed them to be thinned and infiltrated with inflammatory cells but not ulcerated. The introduction of infected material into the bronchus before ligation produced gross septic bronchiectasis with ulceration and destruction of the bronchial walls. Removal of the bronchial plug after 7 to 10 days usually resulted in complete re-expansion of the lung with restoration of the bronchi to their normal condition. These authors conclude that the chief factor which causes bronchiectasis in collapsed lung is infection. If this is mild the bronchi are merely distended with exudate and not damaged; but if severe an irreversible deformity results. As they obtained similar results in the presence of a pneumothorax they state that the negative pressure in the thorax is not a factor in the production of bronchiectasis. This explanation is probably true of those cases in which a large bronchus is firmly and completely obstructed, but such an occlusion is comparatively rare in the human subject. Instances are common in which bronchography has demonstrated bronchiectasis in a collapsed lobe very shortly after the occurrence of the collapse, thus showing that the bronchus supplying the lobe is not obstructed but widely open and dilated. Some other explanation must be found for these cases, and that advanced by Lee, Lander, and Davidson,[10 11] and also by Andrus,[12] seems the most probable. These authors consider that the obstruction in such cases is due to a plug of viscid secretion which is sucked gradually out towards the periphery until it finally becomes split up into a number of tiny plugs which occlude the finer bronchioles. These effectively prevent aeration, and the lung remains collapsed. The large bronchi in the collapsed area are not cut off from the outside air and are subjected to atmospheric pressure, while the negative pressure in the thorax is increased owing to the shrinkage of the lung. This suction is transmitted directly to the bronchi through the inelastic collapsed tissue around them and therefore they dilate.

Thus it seems that in those instances of pulmonary collapse in which there is not complete obstruction to the main bronchial supply the collapse is probably due to peripheral obstruction, and bronchiectasis is caused by the increased negative pressure in the thorax. On the other hand, in those rare instances where the main supplying bronchus is completely occluded the bronchi are at first constricted, owing to the absorption of the air within them, but later become distended with inflammatory exudate. In both conditions severe infection may ensue and cause a permanent bronchiectasis by ulceration of the bronchial walls.

JAUNDICE AND YELLOW FEVER VACCINE

The occurrence of jaundice in patients a considerable time after they had been inoculated with a yellow fever vaccine and immune serum was described by Findlay and MacCallum[13] in England in 1937 and by Soper and Smith [14] in Brazil in the following year. The available data indicated that the disease was not yellow fever in any form. It was later suggested by Findlay and MacCallum[15] that the causative agent of this condition might have been a virus which was present in the human serum used either for growing or suspending the virus or in the immune serum inoculated with the vaccine. Both the above groups of workers restarted their cultures with a clean strain of virus, and all serum used was heated for at least 30 minutes at 56° C. No further cases have followed the use of vaccine made in England since November, 1937. After over a million people had been inoculated in Brazil the condition reappeared again in October, 1939, in about 27% of a group of 304 persons all inoculated by Fox *et al.*[16] with one lot of vaccine about four months previously. In May, 1940, more cases appeared, related to a small number of different lots of vaccine. Out of approximately 107,000 people injected with the incriminated batches there were 1,072 who became icteric after an incubation period of 12 to 20 weeks. The most recent and astounding example of this phenomenon occurred in 1942, when 28,585 cases with 62 deaths were reported[17] in the American Army after the use of a similar vaccine. Clinically many of these cases closely resemble those of infective hepatitis (catarrhal jaundice), but in the latter the incubation period is usually between 20 and 32 days in contrast to that of 8 to 20 weeks in the post-inoculation cases. In earlier reports,[18] in spite of the difference in incubation period, it was suggested that these two conditions might be caused by the same virus, but the accumulation of information as a result of these recent large outbreaks has provided evidence of a much greater incidence of joint pains and skin lesions of different types

[4] *J. R.A.M.C.*, 1938, **70**, 289.
[5] *Amer. J. Dis. Child.*, 1941, **62**, 309.
[6] *Lancet*, 1941, **2**, 628.
[7] *British Medical Journal*, 1940, **2**, 891.
[8] *J. thorac. Surg.*, 1942, **11**, 571.
[9] *Arch. f. exp. Path. u. Pharm.* 1879, **10**, 54.
[10] *Brit. J. Radiol.*, 1938, **11**, 65.
[11] *British Medical Journal*, 1938, **1**, 1047.
[12] *Amer. Rev. Tuberc.*, 1937, **36**, 46.
[13] *Trans. roy. Soc. trop. Med. Hyg.*, 1937, **31**, 297.
[14] *Amer. J. trop. Med.*, 1938, **18**, 111.
[15] *Proc. roy. Soc. Med.*, 1938, **31**, 799.
[16] *Amer. J. Hyg.*, 1942, **36**, 68.
[17] *J. Amer. med. Ass.*, 1942, **119**, 1110.
[18] *Trans. roy. Soc. trop. Med. Hyg.*, 1939, **32**, 575.

than have been recorded in infective hepatitis. Fox and his colleagues also noted a much higher incidence in the older age groups in their vaccinated population. Fortunately all information available at present indicates that in the average patient hepatic damage is slight and repair prompt and complete. As the tendency is to incriminate the human serum used for suspending the virus in the vaccine, the serum has been eliminated from use in both North and South America, and the vaccine is now merely an extract of finely ground infected chick embryos diluted with distilled water. A somewhat similar condition occurring in children after the use of measles convalescent serum and adult serum was described by MacNalty[19] in 1937 and Propert[20] in 1938. There was a long incubation period of 8 to 12 weeks, followed by hepatitis of varying severity but in general more serious than in the post-vaccine cases. This latter may have been the result of the very much larger quantity of serum which the children received. Neither in this instance nor in the use of vaccine in England or in South America was there any history of jaundice in any of the donors of the serum. The view that this condition is caused by an infective agent has not as yet received any experimental or clinical proof. All attempts at animal transmission have been unsuccessful, and there have been no recorded instances of suggestive contact cases except by Propert. The view that the disease is caused by the action of some toxic agent or peculiar property of certain human sera receives some support from accounts of similar happenings in horses many weeks after the inoculation of horse serum in immunization against horse sickness,[21] equine encephalomyelitis,[22] and anthrax.[23] It is desirable that physicians should make sure that their cases of so-called catarrhal jaundice may not have some other origin.

LIVER PUNCTURE

The differential diagnosis of hepatomegaly or jaundice rests only too often on the results of laparotomy or the findings at necropsy. Cullinan[24] has pointed out that there is very considerable risk that death may follow from haemorrhage or liver failure if the abdomen is opened in subacute necrosis of the liver. Iversen and Roholm[25] have recently elaborated a method of liver biopsy which enables them to study the histology of the liver during life without opening the abdomen. A liver puncture is made with a trocar through the 9th intercostal space and a column of liver tissue is obtained by aspiration. The specimen is one to two centimetres long and about two millimetres in diameter. The procedure itself is usually painless, though a few patients experienced severe pain, and two had minor reactions with sweating, pallor, and nausea. Two also had a rise of temperature lasting a day or two. The real danger of the method lies in the risk of haemorrhage. Iversen and Roholm record no fatalities in 116 aspirations, but at necropsy on one patient with obstructive jaundice, who died 9 days after the puncture, 1½ litres of blood-stained fluid was found in the peritoneal cavity, and in another there was a large clot at the site of the puncture. Baron[26] and Köfler[27] have also used liver puncture but prefer a subcostal approach, as they consider there is less danger of bleeding from capsular tears. Baron had one fatality from haemorrhage, and in one case a piece of colonic mucous membrane was aspirated, although, surprisingly, no evidence of perforation could be found at operation. Köfler used both methods of approach, and among 100 aspirations there were two deaths from haemorrhage.

Although this is obviously a risky method of investigation, it has proved to be of real use. Roholm and Iversen[28] studied infective hepatitis, obtaining a clear picture of the histology at all stages of the disease where jaundice was present. They found well-marked inflammatory changes with destruction of the trabecular structure and disintegration of the parenchyma cells. There was a varying amount of proliferation of the connective tissue, which in three cases suggested a cirrhosis. The interlobular bile ducts were unaffected. Köfler confirmed their findings. Roholm and Krarup[29] studied the changes in obstructive jaundice. Obstruction due to gall-stones or to cancer caused the same type of change. Cirrhosis was late in appearing and was marked only after the 180th day of jaundice. In cholelithiasis the changes subsided rapidly if the jaundice was of short duration. Baron showed that this method was also useful as a purely diagnostic procedure. Among 18 cases of hepatomegaly he was able to prove secondary carcinoma in 12 cases, and to diagnose such comparative rarities as congenital cystic disease and cavernous angioma as causes of enlarged liver. Aspiration failed to reveal carcinoma in only two cases in Baron's series, although Iversen and Roholm recorded 22.5% of aspirations as complete failures. The risk of haemorrhage appears to be highest in severe anaemia and haemorrhagic diathesis, and here liver puncture should be avoided. The tendency to bleed in obstructive jaundice can be overcome by the use of vitamin K. In spite of its dangers, this seems to be a really valuable procedure, which could throw new light on the development and pathology of many obscure conditions.

THE PRIME MINISTER'S PHYSICIAN

All members of the profession will wish to join us in congratulations to Sir Charles Wilson on the high honour conferred upon him by the King. His services to medical education and in particular to St. Mary's Hospital are widely recognized, and his acute and alert mind must be of benefit to the House of Lords. But the appreciations printed so far have scarcely touched upon the outstanding fact that the President of the Royal College of Physicians of London, now in his second year in that chair, is the personal physician to Mr. Churchill and as such has flown with the Prime Minister to at least three far-distant Allied capitals on missions of great consequence to the united war effort. The elevation of Sir Charles Wilson to the peerage may well be regarded as a public acknowledgment not only of his merit as an adviser on medical policy at No. 10, Downing Street, but also, and far more important in these momentous times, of his value to our country and our allies in safeguarding the health and energy of the statesman who leads and personifies the British will to victory. This is a very responsible key post, though unmentioned in the official New Year Honours list, and no praise or reward can be too high for its successful holder.

"Aids to the Investigation of Peripheral Nerve Injuries" is the title of M.R.C. War Memorandum No. 7, compiled by the Nerve Injuries Committee of the Medical Research Council (H.M.S.O., York House, Kingsway, London, W.C.2; 2s. net). After a short introduction of a page and a half the remaining 46 pages consist of photographs and diagrams designed to show those "less experienced in the examination of patients with lesions of peripheral nerves" how to diagnose these. This admirable atlas has been prepared by the staff of the Department of Surgery, University of Edinburgh.

[19] *Ann. Rep. Chief Med. Off. Min. Hlth.* for 1937, H.M.S.O., London, 1938.
[20] *British Medical Journal*, 1938, **2**, 677.
[21] 5th and 6th reps. of Director of Vet. Res., Union of S.A. Dept. Agric., 1918, 7.
[22] *J. Amer. vet. med. Ass.*, 1938, **93**, 285.
[23] *Norsk. vet. Tidsskr.* 1938, **50**, 69.
[24] *St. Bart's Hosp. Rep.*, 1936, **69**, 55.
[25] *Acta med. scand.* 1939, **102**, 1.
[26] *Arch. intern. Med.* 1939, **63**, 276.
[27] *Z. klin. Med.* 1940, **138**, 744.
[28] *Acta path. microbiol. scand.*, 1939, **16**, 427.
[29] *Acta med. scand.*, 1941 **105**, 48.

CONTINUING RESEARCH ON CANCER

The nineteenth annual report of the British Empire Cancer Campaign is less bulky than its predecessors, but in smaller type it gives probably the same amount of information. It was presented to the annual general meeting of the Campaign on Dec. 15, the Duke of Gloucester presiding. Reports from some twenty-four research departments or branches of the Campaign in this country and eleven over-seas, as well as from a number of individual workers, are embodied. The Campaign has spent £100,000 since the war began, and has subsidized to the fullest extent every associated research centre.

Nutrition in Relation to Cancer Incidence

Bittner found that there exists in the milk of female mice of high-breast-cancer strains a factor concerned in the development of spontaneous breast cancer. In the Department of Experimental Pathology and Cancer Research of the University of Leeds this observation has been used in studying the effects of oestrogenic stimulation upon male mice. The newly born young of high-breast-cancer strain were transferred as soon as possible after birth to mothers of low-breast-cancer strain, and vice versa, and in the young males after weaning injections of triphenylethylene were made and continued until death. The results so far indicate that there is an almost complete reversal of the expected incidence of breast cancer in the treated males. Of the mice which have died only one high-breast-cancer mouse suckled by a low-breast-cancer foster-mother developed breast cancer, whereas all but three of the low-breast-cancer mice suckled by a high-breast-cancer foster-mother have died of breast cancer. The untreated female littermates have also been observed, and again the effects of deprivation of the milk factor are very marked. In another laboratory, at the Royal Victoria Infirmary, Newcastle-upon-Tyne, by fostering mice of low-cancer strain on females of high-cancer strain, the incidence of mammary carcinoma in the former has been raised from about 5% to nearly 60%.

Again at Leeds an attempt to induce lung cancer in mice by intranasal administration of methylcholanthrene and 1:2:5:6 dibenzanthracene has produced an interesting and unexpected result in the appearance of breast tumours in several of the experimental animals, and when pure inbred strains were used it was found that mammary cancer occurred in two strains in which it had not been known to occur spontaneously. It is suggested that the most probable explanation is that the carcinogen reaches the breast via the nipple and exerts a genuinely local effect on the mammary epithelium.

Other work on carcinogenesis comes from the Sir William Dunn School of Pathology at Oxford, where it has been shown that there are substances which, although incapable of producing the pre-carcinogenic state, are yet capable, when applied to skin already rendered neoplastic by other means, of precipitating the development of papillomata, and also, when allowed to act on papillomata already established, of facilitating their conversion into malignant tumours. It seems, therefore, that carcinogens may be resolved into three independent components, and the substances concerned in the process may be divided into "complete" carcinogens, when they are able to induce all three actions (that is, pre-, epi-, and meta-carcinogenic), and "incomplete" carcinogens when, like croton oil, they can induce only one of the processes. The existence of "incomplete" carcinogens may have important clinical implications.

A very interesting piece of work in general pathology comes from the Glasgow Royal Cancer Hospital. Last year two workers there reported that rats fed on an adequate basal diet to which heated lard was added developed vitamin A deficiency and papillomatosis of the fore-stomach, a lesion which could be prevented or cured by the addition of raw carrot to the diet. It has now been shown that similar protection is afforded by adding cod-liver oil, and further that the change from white bread to national bread has stopped the occurrence of gastric papilloma in rats on a diet poor in vitamin A.

Clinical Research

Finally, passing over much other work of interest, including progress in the correlation of the quantities of energy involved in the medical use of different types of radiation, a further detailed analysis by the Clinical Cancer Research Committee of the Campaign is given. This year it concerns 473 cases of carcinoma of the oesophagus registered in London hospitals during 1938 and 1939, together with a brief review of 65 cases of post-cricoid carcinoma. Figures are given showing the site of the disease, the stage to which it had advanced on admission to hospital, the procedures used to confirm the diagnosis, the treatment, and the results. The first symptom was dysphagia in 67% of the cases; in the remainder, misleading symptoms led to mistakes in diagnosis. In only 5 cases was radical surgery possible. An analysis shows the high mortality of exploratory operations and the operative risks of intubation or dilatation. The results of radiation treatment were disappointing. Of the 65 patients with post-cricoid cancer, 56 died in the first year from the beginning of treatment, 3 died in the second year, and 1 in the third; 2 of the remaining cases are known still to be alive and 3 are as yet untraced. Of the 473 patients with carcinoma of the oesophagus, 399 died with cancer in the first year, 19 in the second year, and 5 in the third. A significant point is the sex difference. Of 65 cases of post-cricoid cancer, 54 (83%) were in females, whereas of 473 cases of oesophageal cancer only 76 (16%) were in females. The mean age of the post-cricoid cases was 65 years for males and 55 for females, and that for the oesophageal cases, 64 for males and 61 for females.

MEDICAL VISITS TO AFRICA AND MALTA

Dr. A. G. H. Smart, medical adviser to the Colonial Office, who has recently returned from the Middle East, and Dr. W. H. Kauntze, assistant medical adviser, who had previously during the year visited Africa, have given brief accounts of their tours to the Colonial Advisory Medical Committee.

Dr. Smart told the committee that one of the main reasons for his visit was to inquire on behalf of the Secretary of State into the welfare and state of health of the people in each territory after the strain occasioned by three years of war. Another was to satisfy himself that liaison between the Services and civil authorities was as complete as possible. He had since reported fully to the Secretary of State on these two aspects of his visit. He dwelt on the position that he had found at Malta, where his visit coincided with the arrival of a food convoy. One thing that had impressed him very much during his tour was the whole-hearted devotion to duty that was apparent everywhere, and he noted how in this effort, as in this country, women were taking a prominent place.

Dr. Kauntze told the committee something of his tour, which occupied six months and covered most of tropical Africa. He, too, had certain specific objects in mind during his visit on which he was able to give some information to the committee. Among other things he found that great progress had been made in maternity and child welfare work, more especially in East African territories. He also noted developments in the organizing of dispensaries as welfare centres in West Africa and mentioned the need for an increase in numbers of subordinate staff with better facilities for training. He also spoke of the advance which had been made in medical education at Makerere College in Uganda, and at the Yaba Medical School at Lagos, Nigeria.

INDUSTRIAL MEDICAL SERVICES IN WARTIME

A special meeting of the Association of Industrial Medical Officers was held recently, to which representatives of the Royal College of Nursing, the Association of Examining Factory Surgeons, and the Association of Scientific Workers had been invited, to discuss industrial medical services in wartime.

In opening the discussion Dr. M. W. GOLDBLATT, who presided, said that planning was necessary both in allocating medical manpower for the industrial medical service and in determining the status and duties of medical officers once they had entered it. Practical schemes for dental and ophthalmic services in industry, the provision of suitable canteens, the training of first-aid personnel, and the education of the worker in elementary principles of hygiene were all matters which should occupy the new medical officer's attention. Sir DAVID MUNRO pointed out that it was the duty of the industrial doctor to see that we were able to use available labour most economically and avoid wastage by ill-health and accident. Dental, ophthalmic, *x*-ray, and rehabilitation services were all necessary to this end. He would like to see an Institute of Industrial Medicine established which would become a centre of research, particularly into toxic substances. In time industrial medicine should have its own diploma. Mrs. A. PERRY, S.R.N., said that the scope of the industrial nurse varied in different factories according to the size of the medical department. In a large factory with its own

doctor the nurse should be responsible to him, and should enjoy a status equal to that of the welfare officer and personnel assistants. In the smaller factory she should be responsible to the managing director, and could, in many cases, if trained accordingly, combine the duties of nurse and labour officer with considerable advantage to everyone. Dr. J. H. HUMPHREY of the Association of Scientific Workers said that at present 75% of the workers were in factories of fewer than 1,000 persons and were unlikely to have any industrial medical service. He asked to what extent the results of experience in industrial medicine and hygiene were being recorded and what statistical skill was being brought to bear on them. Dr. M. W. PATERSON spoke of the good work done by the first-aid personnel, who knew conditions in their own factory and had the confidence of their fellows in the early treatment of the industrial injury. But the existing instruction manuals, he said, were inadequate and present methods needed to be completely revised. Dr. E. H. STRANGE had found that hygienic conditions in canteens were often bad. The proper washing of dishes and utensils and the control of waste should, he said, be among the matters which the industrial doctor should observe when inspecting a canteen. In the discussion which followed, Dr. TOM GARLAND said it was clear that the present industrial medical services were inadequate and should be expanded to cover all workers, especially those in the small factory, and that to achieve this State control was necessary.

Reports of Societies

NEUROLOGICAL COMPLICATIONS OF MALNUTRITION

At a meeting of the Section of Neurology of the Royal Society of Medicine on December 17 a short discussion took place on the neurological complications of malnutrition.

Dr. V. P. SYDENSTRICKER, who is in this country with the U.S. Army, spoke on nicotinic acid deficiency, adding that the influence of the deficiency of other vitamins of the B group was not known, though probably all were implicated. The neuropathic symptoms were not specific; they might resemble neuroses of almost any type as well as the ordinary functional and toxic psychoses. Partial deficiency of nicotinic acid caused deviations which at the time were mild but led on to serious anatomical changes. Lassitude, slight mental deterioration, and loss of memory for recent events were common; insomnia, headache, and paraesthesia were also noted, and characteristic glossitis and dermatitis might make their appearance. A large number of patients who were treated before nicotinic acid became available were definitely psychotic, and in severe cases of long duration the cure did not follow even prolonged nicotinic acid treatment. In some patients stupor alone was found on admission to hospital, but "cart-wheel" rigidity afterwards developed. The management of these states was very simple. The patient should be fed during the first few days on a liquid diet of milk, eggs, and cereal gruels, given by stomach tube if necessary. It was often possible to add marmite to the liquid food. Some improvement was shown in the majority of patients within 48 hours of beginning treatment. Not all instances of delirium, mania, and hysterical manifestations seen in acute infections or in post-operative states were due to avitaminosis, any more than all stuporous states found in elderly people were due to that cause, but it always seemed worth while to investigate the matter and to give nicotinic acid psychosis a place in the diagnostic list.

Dr. H. M. SINCLAIR said that almost every member of the "vitamin band wagon" had been incriminated in discussing the origin of peripheral neuropathies. Ten or fifteen years ago it was demonstrated that degeneration of the central nervous system could be produced in animals on diet deficient in vitamin A, and it was suggested that a large number of neurological conditions in man were due to this cause. If vitamin A deficiency were established in animals at a sufficiently early age skeletal growth stopped, but the growth of soft tissues, including those of the central nervous system, continued, so that there was overcrowding of the cranial cavity and relative overgrowth of the tissues. It seemed a reasonable conclusion on the basis of recent work that the nervous lesions in vitamin A deficiency were wholly mechanical in origin. In the case of vitamin E most workers were now agreed that there was very little evidence of its importance in preventing neuromuscular disease. On the use of vitamin B_1 for different forms of peripheral neuritis a voluminous literature had grown up, but it had recently been suggested that it would not stand critical review. If he might summarize the position rather dogmatically, it appeared that some types of polyneuritis were accompanied by deficiency of vitamin B_1, and the same was true of some cases of the polyneuritis of pregnancy. Arsenic and alcohol inhibited utilization of the vitamin. In the peripheral neuropathies, while deficiency of vitamin B_1 no doubt played an important part, it was not the only factor.

Identifying the Vitamin

Dr. R. M. STEWART, who presided, said that the clinician's difficulty was that very often in these mild states of malnutrition he did not know which deficiency to claim. Clearly in wartime the absence of several vitamins might be cited. During the last war he saw a number of Bulgar prisoners of war among whom there were a very large number of cases of scurvy. On investigating them from the neurological standpoint he found certain abnormal signs due to the presence of very large haemorrhagic extravasations, although in other cases there were very few indications beyond subjective sensory symptoms associated with diminution or loss of ankle-jerks, sometimes bilateral. It seemed to him that it must be very difficult to know, without some saturation test, which vitamin was concerned. The *Journal of the American Medical Association* had recently declared that scrutiny of the life-history of some patients and studies of their personality showed that the earliest effects of nutritional deficiency were not to be found in the polyneuritis of beriberi, the bleeding gums of scurvy, or the dermatitis of pellagra, but rather in mental deterioration, nervous instability, and other forms of vague ill-health, which almost always came first. It seemed rather extraordinary that it should be the brain which first manifested the symptoms of vitamin deficiency when they could all recall cases of illness arising from this cause in which there was no mental change throughout.

Dr. RUSSELL BRAIN referred to a group of patients, mostly women, who were brought to hospital after having lapsed into coma at home for no obvious reason, who showed no obvious signs, and in whom, after death, no neurological change was discovered. Another group consisted of alcoholics who passed into coma after a history of head injury, not of a severe nature. In such cases he had thought of subdural haematoma, but on making an exploration no such condition was found.

Correspondence

Pasteurization of Milk

SIR,—Judging by three of the letters in your issue of Jan. 9 the answer to the question, "Do doctors disagree about pasteurization?" is that they are too imperfectly informed on the subject to be entitled to any opinion at all. The impartiality with which you ventilate opinions contrary to the declared policy of the Association is commendable, but I doubt whether this licence, fashionable though it is in the present mood of this country, should be extended to misstatements of fact. According to Dr. Eric Coldrey (p. 52), "Most people define pasteurization as the raising of milk to 150–160° F. for 20 minutes." Pasteurization by the holder process is officially defined as maintaining milk at a temperature of 145–150° F. for 30 minutes. That this process can be depended on to kill tubercle bacilli and all other agents of milk-borne infection is an incontestable fact, and Dr. Coldrey's opinion and experience have no weight against it whatever. The thermal death-points of bacteria are not a matter of opinion; they are well-ascertained facts. Either the milk supplied to his patients was inefficiently pasteurized, or—which is very likely—they drank raw milk at some period not covered by his inquiries, or they acquired their infection from some other source. Dr. A. H. Macdonald (p. 52) offers us the information that tubercle bacilli and "99% of other pathological germs" get into milk "largely through dung and dirt." This is simply not true. Tubercle bacilli in milk are derived from lesions in the cow's udder, typhoid bacilli usually from the hands of a milker who is a carrier or from contaminated water used for washing pails or churns, and the streptococci which cause epidemics of milk-borne scarlet fever usually from the throat of a milker. Of what worth is Dr. Macdonald's opinion if it is founded on fancies such as this? The idealism of Dr. E. K. Mackenzie (p. 52)

is in a different category, but has he any conception of the holocaust by which alone the elimination of infected cattle is immediately feasible, of the ruin which it would bring to the dairying industry, and of the disastrous effect on food production, all perfectly unthinkable at such a time as this? Even in times of prosperity and plenty the eradication of bovine tuberculosis must be a colossal task occupying many years. Are we not entitled in the meantime to demand that milk shall be made safe by pasteurization?

The producer-retailer and the small dairy which cannot afford to instal and operate a pasteurizing plant are by no means the only obstacles to this reform. Owing to the misinformation and prejudice that are so rife—a position for which some members of our profession are evidently in part to blame—there are many large dairies whose directors are unconvinced of their duty to pasteurize. I now have the misfortune to be supplied in my own household by such a firm. Having hitherto been supplied with pasteurized milk by another dairy, I am compelled by a new zoning scheme for milk delivery aimed at economy in transport to accept raw milk from the dairy to which my area is allotted. As an advocate of pasteurization for many years I find this an intolerable and almost ludicrous position. If we must be deprived of choice of dairy, then the time has come when we should again demand compulsory pasteurization.—I am, etc.,

LAWRENCE P. GARROD.

Local Application of Promin in Tuberculous Lesions

SIR,—I was interested to read in the article by Prof. W. H. Tytler and Dr. A. D. Lapp (Dec. 26, p. 748) of the treatment of superficial tuberculous lesions by the local application of promin, the success of which raises once more the hope that even the tubercle bacillus may eventually succumb to chemotherapy. In their report the authors state that the trial treatment of cases of pulmonary tuberculosis has been fairly extensive though published results are yet scanty. More detailed reports will be awaited eagerly.

Meanwhile it is interesting to speculate on some possible general applications of a drug having a selective action for the tubercle bacillus. Such a drug might be used with great success on the early case with the minimal lesion and moderate toxaemia; some sort of prophylaxis with regard to contacts might also be possible. The high solubility and rapid absorption of promin, however, together with its effect on the blood cells when used in high concentrations, would appear to preclude its use in this direction at present.

But it is the chronic consumptive with his persistently positive sputum who creates the biggest obstacle to the successful treatment of tuberculosis. Sanatorium can benefit him very little except to isolate him from the community and his environment for a time. Such a patient, although incapacitated, is not always ill; there is little toxaemia, and one might hesitate to flood his system with a drug capable of destroying the bacilli *in situ*, if such were possible. Might it not cause a marked toxaemia from the disintegrating organisms? This is only conjecture, and one must await the result of further trial. Meanwhile there still remains, as the authors assert, the justification for more extensive trial of promin by local application to suitable lesions.—I am, etc.,

Congleton. D. S. HAYES.

Staffing Mass Miniature Radiography Units

SIR,—The battle for mass miniature radiography has been brought to a successful conclusion with this form of examination now established in the three Services, and an early start is anticipated on the civil population this year. But as yet we have no specific details of the exact organization that is proposed for the control and running of the units.

The accurate interpretation of these miniature films is important and frequently difficult. The staffing of the units with adequate, properly trained, and experienced assistants is essential, otherwise the method must rapidly degenerate and fall into disrepute as the result of faulty diagnosis and wrong disposal of the patient. To become expert in interpretation of radiographs of the chest requires many years of wide and varied experience in this field, whether a radiologist or "an expert chest physician" with knowledge of chest radiology. We are told there is now a scarcity of such "experts," and therefore the importance of the careful selection of those responsible for the running of the units cannot be overstressed. It does not follow that because a medical practitioner receives an appointment as a tuberculosis officer he is fully conversant with radiological interpretation of the chest. The reverse is not infrequently the case. Nor does it follow that because someone possesses an *x*-ray plant or holds hospital appointments in radiology he is expert in chest radiology. It might therefore seem that whatever staffing of these units is finally decided upon, more than one opinion on each chest film would be advantageous, and a safeguard to reduce the possibility of error of diagnosis. Perhaps each unit will have attached to its staff one chest physician and one radiologist experienced in chest radiology to form a panel of "expert interpreters," while these units may eventually become distributed throughout the country on a regional basis, with a central administrative panel or committee to which final appeal could be made in cases of extreme difficulty of diagnosis.

As to the claim of the "competent chest physician" who suggests all the work, both clinical and radiological, should be the province of the physician only, this is surely a retrograde step. After all, only some 3 to 5% of the cases are commonly pathological, and consequently a chest physician performing the dual role would be devoting an additional 95% of his time to viewing normal lung fields. Might not his expert services be more profitably employed in his real province—the clinical side of the examination?

In this country the number of examinations achieved per hour, day, or year seems to be modest compared with the claims of Continental workers. The numbers examined by the individual unit, however, largely depend on the number of assistants and the dressing space available to permit patients to pass as a constant stream through the *x*-ray machine; also the inclusion of an electrically controlled camera in preference to the earlier experimental hand-operated camera, and, finally, the use of long strips of film (100 to 200 negatives) instead of the short 36-negative pieces. The most recently published figure by the R.A.F., suggesting a target of 100,000 cases per unit per year, should be speeded up to 300,000 or nearer 500,000 cases a year. At a speed of 100,000 cases a year it would take 80 years for one unit to examine Greater London.

As to the civil organization and the radiologists available, it is my view that radiologists are not fully organized in this country. There is still overlap between the voluntary hospital and E.M.S. radiologists in that much of this work could be fused and one carry out the two duties and some additional *x*-ray work as well. Until radiologists are mobilized more on a national basis this overlap will persist and so the apparent shortage be exaggerated.—I am, etc.,

London, W.1. NORMAN P. HENDERSON.

Intestinal Obstruction

SIR,—The reading of the medical memorandum by Mr. V. C. J. Harris on an unusual case of intestinal obstruction in a child (Dec. 26, p. 754) and the annotation on gastro-intestinal concretions (p. 757) brought to my memory a case upon which I operated a few months ago of a woman, aged 71, who had complained for 6 days of severe abdominal pain centred round the umbilicus with vomiting and constipation of 5 days' duration. Her abdomen was somewhat distended and tender and a diagnosis of obstruction was made. A laparotomy was performed, which revealed the presence of a moderately inflamed and distended small gut with free blood-stained peritoneal fluid and a hard round mass which appeared to be obstructing the terminal ileum. An incision was made over the mass and it was removed and the bowel sutured. She made a good recovery. The mass subsequently proved to consist of congealed faecal matter on a base of fruit skins, and was quite hard. Inquiries after operation showed that some days previously she had partaken of raw Victoria plums, which, she said, had never agreed with her.

This case also called to mind the reports of others very similar (Latchmore, "Stomach-ache," *Lancet*, 1940, **1**, 1153). Perhaps obstruction by a food bolus or bezoar is by no means so uncommon and should be borne in mind in differential diagnoses of obstruction. The legend of the bezoar stones, which was generally credited in olden times, was that they were the crystallized tears of deer. The deer ate snakes, which

caused such intense stomach-ache that tears were brought to the animal's eyes, and these subsequently congealed beneath the lid as stones. These fell out and men gathered them up. Cases of poisoning and other noxious diseases were said to have been cured by them, and one was used as a last resort at the death of King Charles II (R. E. M. Coke Harvey, "Medical Bypaths: A Record of Some Peculiar Practices," *Middlesex Hospital Journal*, 1939, **39**, 128). It may possibly be of interest to the academically minded surgeon to consider that what was once a magical stone endowed with life-giving properties is now a cause for surgical intervention and a portent of evil.—I am, etc.,

Aylesbury. RALPH H. GARDINER.

Treatment of Dysentery at Sea

SIR,—So much has been written about the treatment of dysentery that one hesitates before reporting one's own results. However, treating dysentery on shore with the advice of laboratory findings and treating it at sea are two different propositions. Because of this the experience obtained on this voyage will, we trust, prove useful, not only to others in similar circumstances but also to those who are not in proximity to a laboratory.

The first case was that of the chief steward. He had had diarrhoea for six days and had been "warding it off" with double whiskies with some degree of success till the sixth day, when this ally failed him. During this time he had had very little to eat, and was weak when first seen. Stools were very frequent, the temperature was 99.5° F., and the pulse 105. Ol. ricini 1 oz. was given at once and fluids prescribed, brandy being allowed in small quantities because of the low state of the patient. The following day mist. bismuth. was given four-hourly. At the end of the day his condition was worse, the evening temperature being 101° F. The following day, no sodium sulphate being available, magnesium sulphate was given four-hourly. Food was still withheld, but the bowels continued to act frequently, blood and mucus being passed. This continued for the next twenty-four hours, when the evening temperature was 102° F. The possibility of an amoebic infection was considered, and it was decided to try an injection of emetine hydrochloride 0.03 g. Two to three hours later the patient showed a slight improvement, there being a decrease in the abdominal pains, although blood and mucus were still being passed. A second injection was given the same evening and two more the following day, when the evening temperature was still 101° F. The next day we were able to get ashore and have a microscopical examination of the stool made. No amoebae could be seen, and the appearances were more in favour of a bacillary infection. We were unable to obtain the result of the culture.

Treatment was discussed with the medical specialist at the R.A.F. hospital at Aden. He stated that he had been using sulphapyridine in similar cases with most satisfactory results, using two tablets three times a day for two days. We had not previously heard of this treatment for bacillary dysentery and decided to try it on our patient. The result was almost dramatic, and within twenty-four hours there was a most marked improvement, and at the end of thirty-six hours he was up and commencing his normal duties. Following up this treatment we used sulphapyridine on several other cases which were not clearing up; these were not so severe as the first one. Again the results were most satisfactory.

A number of other patients reported complaining of diarrhoea, sometimes of forty-eight hours' duration and not uncommonly showing blood in the stool. The routine treatment we adopted was as follows: 1 oz. ol. ricini was given at once, and liquids only were allowed—that is, barley water or oatmeal water to which a pinch of ginger had been added. Six hours later two sulphapyridine tablets were given followed by two more in another four hours, after which soup and dry toast were allowed. The following morning two more sulphapyridine tablets were given and light meals allowed. By this time the condition was nearly always under control, but bismuth was given for two days.

We would point out that these results appear to confirm those obtained by the medical specialist at the R.A.F. hospital at Aden, who first drew our attention to the value of sulphapyridine in these cases. Treatment at sea is given under extremely difficult conditions, as one has not the advantage of laboratory findings. Allowing for this we have been so impressed with the results of sulphapyridine treatment following castor oil that we feel this method is well worthy of fuller trial.—We are, etc.,

A. G. MCMANIS,
Flight Lieut., R.A.F.
W. GORDON RICH,
Major, N.Z.M.C.

At Sea.

Teaching First Aid

SIR,—As one who, like Dr. G. Laurence (Dec. 26, p. 767), has to teach first aid to members of both the Red Cross Society and the St. John Ambulance Brigade I should like to endorse his plea not only for a common textbook but also for a complete revision of the teaching as now published.

The war casualties have taught us, as he states, that the treatment of the patient is more important than that of the lesion, and that for the lesion improvisations are more probable methods of treatment than the set number of bandages and splints as set forth in the textbooks. To give just one example—a compound fractured femur sitting on a chair at the time of his injury was dealt with here by dressing the wound, tying the feet together, and a spot of morphine. He was then carried on the chair, no other method being possible as a stretcher could not get past the debris till the way was clear, when he was removed to hospital on a stretcher, no more splints or bandages being applied. Though very shocked when found he did very well.

The results of dealing with cases like this and of teaching numerous first-aiders have convinced me not only that simpler methods, including more practice in improvisation, should be taught but that the stress which is laid in the textbooks on the bandage and the splint, their positions and number, should be replaced rather by a stress on what the first-aider is seeking to accomplish by their use. This is certainly mentioned in the textbooks, but in their present form the emphasis is all on "one above and below the fracture," etc. This also applies to the teaching on haemorrhage, and has no doubt led to many mistakes. Here the stress, owing to the necessity, which is of the utmost importance, of learning the pressure points, has been on arterial haemorrhage. The types of haemorrhage can be rammed over and over again into a class, but the thrills of a pressure point and, still better, the tourniquet are irresistible; so on it goes, stopping the steady stream, but quite unnecessary and of course dangerous. In big print the textbook should deal with the types of haemorrhage, stressing the need for diagnosis of the type, and a word on the probable frequency of the types might help.—I am, etc.,

Skegness. M. BACKWELL.

First Aid for Fractured Spine

SIR,—I have read with much interest the letters on the above subject, and I am also indebted to Mr. Thos. Stowell for very full details of his method of turning cases of this type. As a general practitioner in a busy colliery village (blessed with an excellent first-aid personnel) I would ask the experts, Why is it necessary to turn the patients at all; why not do them up as they lie?

This colliery has its share of accidents, and as the nearest hospital is 30 miles away transport of serious cases calls for fairly efficient first aid. The following is the method of dealing with cases of fracture or suspected fracture of the spine as carried out by the colliery team under Mr. Robt. McCormick. So far no complaint has been received from any patient, and the surgeons have at one time or another been quite complimentary.

Kirkconnel Method

Personnel: 4 first-aiders, whom we will number 1, 2, 3, and 4. Materials: 1 strong rug or blanket; 2 splints to extend from head to feet; 2 splints to extend from armpits to feet; 1 rug to make a pad between the legs; 7 triangular bandages and 1 short splint to pass the bandages.

Bearers 1 and 3 take up position at the sides of the patient, No. 4 is at the head, and No. 2 at the feet. The rug is pleated up from top to bottom and is placed at the patient's head. Nos. 2 and 4 apply extension and counter-extension, while Nos. 1 and 3 pull down under the injured man in the following manner. Placing their inner hand against the patient's side, they grasp the edge of the rug with the outer hand and pull downwards and outwards, so

that, besides pulling down, they are also pulling against each other. This prevents the edges from being turned up and thus increasing the friction; in addition it maintains a minimum of thickness between the patient and the ground. The first pull is made to the waist, and by successive pulls the whole rug is drawn down to this hollow, the upper edge remaining at the level of the head. By a similar movement it is pulled into the hollow below the buttock and, in successive stages, to the feet. The rug is now "straightened out" and turned over the patient while bandages are passed as follows: under the neck, armpits, upper chest, lower ribs, hips, above the knees, and under the ankles. The covering rug is again spread out on the floor and the folded pad made with No. 2 rug is placed between the legs: it should reach from the crotch to the feet.

The two short splints are now placed on each side edge of the rug, the top level with the head. They are then rolled inwards in the rug and traction is exerted on them till they come tight up against the patient's body with the part under his back perfectly taut. Bearer No. 1, standing at the head, grasps the rolled-in splints at the level of the shoulders. No. 3 astride over the patient grips opposite the hips and No. 2 grasps the rolled-up rug at the ankles. All lifting carefully together, the patient is slowly raised a couple of inches from the ground, just sufficiently to allow the two long splints to be slipped under the patient on top of the bandages, so as to lie along either side of the spinal column. The patient is carefully eased back to the ground and the short splints are rolled out of the rug and re-rolled in it so that their upper ends are now at the level of the axilla. In tying the bandages, starting at the top, the first and second are tied to each other close to the seams of the jacket and the long ends tied together over the chest in the middle line. The remaining bandages are tied firmly in the middle line, except that at the ankles, which forms a figure-of-eight around the feet.

Loading on to a stretcher is performed by the same lift as was used to pass the long posterior splints. For a long journey the back splints may be padded with rugs folded lengthwise, and the side splints can be padded with tow, etc., if desired. Pads of wool may be placed under the bandages on the chest to prevent friction.

For the prone position a similar procedure may be adopted, the splints being placed either down the back or under the abdomen. Owing to the absence of natural hollows when lying prone, a modified method of rug passing will be called for. A pull of six inches only is made from the head, and then, by a series of 6-inch waves, the rug is passed to the feet. This assures that there is only a small area of folded rug under the patient at any one time. This latter method can also be used for supine patients whose "natural hollows" are not much in evidence.

For fractures in the cervical region the following additional equipment is required—2 bandages, 2 short splints, and 2 large pads. The procedure is the same as for trunk fractures, but the extra bandages are placed under the head and neck. The two pads are used to steady the head, and are supported by the short splints, which, in the final roll-in, are used from the shoulder to the top of the head.

The final result obtained by this method is: (*a*) the patient runs no risk of further damage by being moved unnecessarily; (*b*) he is comfortably encased in an "orange-box" which allows of safe and easy transport; (*c*) he can, on arrival at hospital, be placed, if desired, directly on the *x*-ray table, the back splints can be slipped out, and he can still be safely handled for removal to bed after the desired exposures have been made.

It may be emphasized that the technique is very much easier to carry out than it is to describe in detail. Theoretically it may be all wrong: in practice it yields satisfactory results. I am much indebted to Mr. McCormick for assistance in detailing the various steps in the above description.—I am, etc.,

BOWMAN EDGAR,
M.O., 4th Battn., Dumfriesshire H.G.

Kirkconnel.

Artificial Respiration

SIR,—In justice to Schafer's memory it should be noted that his method is that of the cylinder and piston. It is unauthorized modifications of it that demand chest elasticity. The Royal Life Saving Society has the original paper for verification.—I am, etc.,

W. J. BURNS SELKIRK.

Birmingham.

SIR,—Surg. Lieut. G. H. Gibbens (Dec. 26, p. 751) has done a good service in reminding the profession of the advantages of Eve's method of artificial respiration. I have always felt that the rationale of the Schafer method as outlined in the St. John organization textbook and the Royal Life Saving Society A.R.P. handbook was unconvincing. They teach that the "piston" action of the diaphragm is the main factor in causing lung ventilation, but as the diaphragm and abdominal musculature are placid and almost toneless in the apparently dead I fail to see why the "viscera resume their former position, the diaphragm descends . . ." when pressure on the loins is released in the inspiratory movement. It may do so in practice on the *living* subject, but conditions are not comparable.

In Eve's method this piston action is ensured by gravity and the attachment of liver and stomach to the diaphragm. It appears to me that Eve's method has a definite theoretical superiority over Schafer's, which would seem to be borne out by practice.—I am, etc.,

L. GOLDMAN.

Seascale, Cumberland.

Absorption of Iron

SIR,—The rate of hydrolysis of a number of organic iron salts to colloidal ferric hydroxide and to particles of ferric hydroxide was observed in an alkaline medium (sea-water, *p*H 8.2). Of these the ascorbates were least rapidly hydrolysed and precipitated.[1] The solubility of ionic iron in alkaline media is extremely low, no more than 4×10^{-10} mg. Fe per litre of Fe^{++}, Fe^{+++}, $FeOH^{++}$ at *p*H 8 when equilibrium has been attained,[2] although the concentration of dissolved oxygen may have reached a very low value.[3] It is limited by the insolubility of ferric hydroxide.

From these observations it appeared that absorption of iron in the intestine of mammals might be increased by the presence of ascorbate in the gut contents. This should allow a longer period during which diffusible iron remains in solution after the contents become alkaline. With this possibility in view a patient of one of us, with severe secondary anaemia, who had been treated with large doses of iron and liver for one year (raising the Hb level from 39 to 60% and red cell count from 3,710,000 to 4,590,000 without clinical improvement) was treated with 15 gr. ferri ammon. cit. together with 50 mg. ascorbic acid thrice daily. After 2 months there was very marked clinical improvement and the Hb level had risen to 80%.

It would be of interest to hear of any similar results which support this single observation. The tentative hypothesis which may have led to this encouraging improvement obtains some support from observations that increased alkalinity of the diet has been observed to depress iron absorption and the therapeutic effect of iron salts, while acidity is favourable.[4] It neglects the possibility that ascorbic acid may affect iron transport within the body or haemoglobin formation: cases are recorded where dosage with ferrous sulphate raises the haemoglobin content and lowers the ascorbic acid content of the blood,[5] and intravenous injection of ferric ascorbate is reported to cause a haemoglobin formation in excess of the quantity of iron injected.[4]

Our thanks are due to Dr. Barbara Thomas of the Prince of Wales's Hospital, Plymouth, for permission to publish this case, and to Dr. E. Wordley for blood counts and haemoglobin estimations.—We are, etc.,

H. W. THOMAS.
H. W. HARVEY.

Plymstock.

X-ray Department at Health Centre

SIR,—I do not think it will be clear to your readers from the letter of Dr. J. V. Sparks (Jan. 2, p. 23) what he requires in these health centres. Does he really think it justifiable to put a large *x*-ray unit in every one of the many centres? Does he expect every centre to have the services of an expert radiologist, since he expects the early diagnosis to be made there and deprecates the transfer of the patients to another centre for further investigation? If he thinks the provision of "apparatus of adequate power" to be the only requirement, why should he expect the medical practitioner to understand the equipment and interpretation of the radiographs? He would not expect him to be an expert microscopist, biochemist, cardiologist, etc., and he would not expect every such clinic to be provided with the most expensive microscope and biological equipment, though the cost and upkeep of these are small compared to the *x*-ray unit (even the 30 mA unit, the use of which he undervalues, would cost upwards of £500).

1 Harvey, H. W. (1937). *J. mar. biol. Ass.*, **22**, 205.
2 Cooper, L. H. N. (1937). *Proc. roy. Soc.*, B, **124**, 299.
3 —— (1937). *J. mar. biol. Ass.*, **22**, 167.
4 Schultze, M. (1940). *Physiol. Rev.*, **20**, 37.
5 Farmer, C., Abt, A., and Aron, H. (1940). *Proc. Soc. exp. Biol.*, N.Y., **44**, 495.

Surely patients needing these investigations could be referred to the larger clinics possessing experienced staff and adequate equipment. The words of J. E. Goldthwait (*J. Bone Jt. Surg.*, 1933, April, p. 279) are pertinent here: "In many of our large clinics it would be far better to have the 'chief' remain in the out-patient department and let the junior staff carry out the operation work. The skill required for this operative work is much less than that required for diagnosis."

Dr. Sparks's comments on mass radiography are even less convincing. The provision of the 25 mass radiographic units is admittedly for experiment and not a solid contribution to preventive medicine, since to mass-radiograph the population you need at least 500 such units. The only additional evidence these experimental sets will yield, providing they are used by competent workers and subject to criticism, is the relative efficiency of the medical examinations in different areas by different doctors. The revelation of extensive progressing tuberculous disease in a patient should not be regarded as a triumph for mass radiography but rather a slur on the medical examination which missed it. The Ministry maintains that "mass radiography will not be the basis of diagnosis but will be used to sift abnormal cases from the normal in apparently healthy persons." The abnormal will be further examined by other means of diagnosis. Is it reasonable to sift as long as they are apparently healthy? I know from experience that they may and do remain apparently healthy for 20 or more years in spite of certain *x*-ray appearances. Obviously, as it is to be used as the sieve to separate the abnormal from the normal it will be the basis of diagnosis, but, as I have shown, it is a defective sieve which will miss the early case. How will mass radiography help in the detection of such cases as the contacts we see which may be radiographically negative at the first examination but showing extensive tuberculosis after an interval of 3 to 6 months?

The selected inconspicuous lesions may or may not be of clinical significance; they may look suspicious and remain so for 20 or more years, but not until they are associated with clinical signs are they of any significance and should not be allowed to spoil the life of the patient.

Radiology should hold a very high place in diagnosis, but it will deservedly lose it if it is used as a quick substitute for clinical methods.

To carry out mass radiography of the population a large army of full-time experts would be necessary. Are the men who have advised this method of investigation prepared to do the work?—I am, etc.,

Birmingham. JAMES F. BRAILSFORD.

SIR,—The recent article (*Supplement*, Nov. 7, p. 57) and letter (Jan. 2, p. 23) by Dr. J. V. Sparks on the subject of the small *x*-ray set proposed to be installed in the suggested new health centres should call out the support of all radiologists lest war-time conditions perpetuate themselves afterwards. There is a very general impression among non-radiologists that the size and power of an *x*-ray set are somehow related to the number of patients to be examined or to the importance of the hospital. It cannot be too strongly insisted that this is a fundamental error.

The power output necessary in an *x*-ray set is a function only of the permissible length of exposure. Small sets are, therefore, sufficient for limb examinations or to give a rough idea of gross lesions of lungs, etc., in the wards. An adequate chest film requires an exposure time of not more than 0.12 sec., and much less in children, to prevent blurring from the movement of the lung vessels alone, and at least a 200 mA output is necessary for this. Many small sets even have time errors as great. Presumably a good deal of chest examination would be called for at the health centres.

A 200 mA output takes one first to the region of that much-debated horror, the two-valve set. In the first place, this output would be their maximum rating, something which many sets of whatever type never attain. Secondly, two-valve sets are inherently very tricky to use with the Bucky diaphragm if film lining is to be prevented. Thirdly, a two-valve generator differs from a four-valve in price by very little more than the cost of the two extra valves, about £100, or an increase of about 1/6th or 1/7th. A four-valve set for this relatively small extra cost has double the output of a two-valve, making really good chest films possible, a thing absolutely necessary for the diagnosis of early disease. A four-valve set is also very much easier to use with the Bucky, and the saving in film wastage would more than compensate for the extra £100 of first cost within the set's lifetime.

Four-valve sets are not by a long way the last word in equipment, but from the above reasons one can see why they have been adopted all over the world as the minimum necessary for routine work. It is of no use protesting that they cannot be afforded. If they cannot, then the proposal to put any *x*-ray set in the health centres should be dropped as a waste of money, an expensive pretence. I would suggest that the minimum equipment necessary for any place where more than limb radiography is to be undertaken would be a four-valve generator, a rotating anode tube—without which modern high-speed, fine-detail radiography cannot be attempted—and a tilting couch with Bucky and barium equipment. There are now at least three rotating anode tubes capable of continuous screening as well as radiography. A chest stand would also be required. If this is too big, let us face the facts squarely and put in no *x*-ray plant but attack the problem in some other way.—I am, etc.,

Hairmyres Hospital, East Kilbride. D. J. HURRELL.

Service Cases of Venereal Disease on Demobilization

SIR,—Dr. Philip Silver's suggestion (Dec. 26, p. 766) that all members of the Services and the Civil Defence organizations should undergo a Wassermann and a Kahn test before discharge to civil life is an excellent one. May I suggest that as an immediate measure to prevent an increased incidence of congenital syphilis these tests should be done on all women in the early months of pregnancy. Dr. Violet Russell put forward a most convincing case for a routine Wassermann or Kahn test in a paper, "Venereal Disease and the Pregnant Woman," read at the Health Congress of the Royal Sanitary Institute in July, 1935. There are, unfortunately, still far too many ante-natal clinics not yet in line with those of Kensington in undertaking this increasingly urgent routine investigation.—I am, etc.,

London, W.1. D. KATHLEEN BROWN.

Charting the Pulse

SIR,—Your annotation on charting the pulse (Dec. 19, p. 728) gives publicity to a clinical method which is too little practised. On returning to India after 6½ years' military service in 1921, I was sufficiently impressed by the lack of appreciation of pulse values to institute pulse-temperature charts (with accent on the pulse) in the district to which I was posted and carried it to subsequent stations on transfer. As C.M.O., Delhi, I introduced it into the enclave of the Government of India, and later, when Inspector-General, it was spread throughout the Punjab. Its particular value in India was to demonstrate the pulse-temperature ratio in the typhoid group. My charts place a pulse rate of 70 against the temperature of 98° F., rising by decades with each degree of temperature, with a note that pulses were to be charted in red ink and temperatures in black.

I must confess that my subordinates showed no enthusiasm and only a polite interest in my "foible" and would not be surprised to learn that it had fallen into disuse. *Sic transit.*—I am, etc.,

C. H. REINHOLD,
Whitchurch. Col., I.M.S. (ret.).

R.M.B.F. Christmas Gifts

SIR,—I cannot convey more adequately my thanks to your readers for their most generous response to my Christmas appeal than by quoting the letter of a beneficiary, a doctor's widow aged 88, who writes:

"Owing to being very feeble and at times not able to hold my pen, it is not possible to write, but I do want to thank you and my good medical friends who sent me the Christmas gift so acceptable. I am most grateful, for I need much I cannot obtain. Again I thank all to whom I have been indebted for so many years, but the time is getting short. I am very feeble and cannot help myself, also memory and deafness very trying. Yours gratefully."

It is of the greatest satisfaction to me to know that, thanks to your help and the generosity of many, we have not failed to send a Christmas gift to all our regular beneficiaries.—I am, etc.,

1, Balliol House, Manorfields, Putney, S.W.15. THOS BARLOW, President, Royal Medical Benevolent Fund.

Obituary

WILLIAM MACLENNAN, M.B.

G. M. writes:

A full appreciation of the life and work of Dr. William MacLennan has, I hope, been presented by one of his immediate colleagues, and my desire is to express a brief but affectionate tribute to the memory of one from whom I and many others of his pupils and housemen have received our infant nurture and inspiration in medicine. Dr. MacLennan came to hospital and consulting work with a wide experience of general practice, a natural gift for teaching, the zeal and enthusiasm of an evangelist, and the gentleness, understanding, and sympathy of the Great Physician, to whom his life was dedicated in the service of his fellow men. Impairment of his vocal functions led to an early curtailment of his teaching activities, but retirement from hospital only led to an increasing demand for his services as a consultant, while in later years even a serious crippling of his cardiac capacity, which immediately threatened his life, failed to arrest his zest for work. Those of us who had the privilege of visiting him in retirement in his lovely country home at Doune and there enjoying anew the inspiring atmosphere of his dynamic and lovable personality wish to take a fond farewell of a beloved physician.

In the course of another appreciation J. S. C. writes: His *Manual of Diseases of the Stomach for Practitioners and Students* bears the imprint of his vital clinical acumen, and in it he gives in full measure from his deep knowledge of diagnosis, prognosis, and therapeutics. He wrote in the same manner as that in which he worked at the bedside—in close logical pursuit of his objective. When MacLennan was examining at the Finals in Glasgow or Aberdeen the candidate felt the penetrating rays of a keen adjudicator, giving rise to tension but never to emotional shock. In the last war he took his heavy load of Army service in his stride, and then illness halted him awhile. Although sad at having thus to leave his wards and his students, he marched on again with his other work until the eve of Christmas, 1942. To our mortal eyes our ranks are thinned, but that company of great physicians marching ahead is reinforced.

News has just been received of the death at Newcastle, N.S.W., on Aug. 3 last, of Dr. ROBERT USHER RUSSELL. He qualified L.R.C.S.I. in 1883 and L.R.C.P.Ed. in 1886, and travelled extensively before settling in Australia. In 1890 he was appointed junior, and later became senior, medical officer at Parramatta Mental Hospital, where he remained until 1896, when he became medical superintendent of the Coast Hospital (now Prince Henry Hospital), Sydney. Two years later he was appointed medical superintendent of the Mental Hospital, Newcastle, a post which he held until he retired in 1922. For a number of years during this time he acted as Port Health Officer to Newcastle. When mental hospitals were opened at Stockton and Morrisset he was elected to visit them, and was mainly responsible for their establishment. He took an active part in sport, particularly cricket and shooting. He was a captain in the A.A.M.C. until 1919. When he retired he settled in Newcastle, N.S.W. His long career was one of unceasing public service, and he was well known for his readiness to help those afflicted by mental ill-health.

We regret to announce the death on Nov. 1 at Bath at the age of 43 of Mr. HENRY MEREDITH MARTIN, born at Colooney, Co. Sligo. He received his medical education at Trinity College, Dublin, taking his M.B., B.Ch. in 1923. He took an active part in the athletic life of the university, especially as a sprinter capable of very fast time in the 100 yards. After qualifying he became resident medical officer at the Gloucester Mental Hospital, and in December, 1924, joined the Naval Medical Service, retiring in 1931 with the rank of lieut.-commander. He saw service in many parts of the world, and his knowledge of athletic training was instrumental in enabling one of his ships to win a Fleet regatta, although boat pulling was not one of his own accomplishments. After some postgraduate study he was elected F.R.C.S.Ed. in 1932. He then became senior casualty officer and house-surgeon at Leicester Royal Infirmary, an appointment which gave opportunity to his surgical talent. After a further year and a half as senior house-surgeon and resident surgical officer at the Royal United Hospital, Bath, he realized an often-expressed wish and spent six months on the Continent studying surgical thought and methods. On his return he held further resident posts, including one at All Saints' Hospital in order to study genito-urinary surgery. His whole career had but one object—the study of surgery—so that when he started as a consultant surgeon in Bath in 1937 his services were soon in demand. In 1938 he was appointed to the honorary staff of the Royal United Hospital as hon. surgical registrar, a post he filled with distinction and energy. After starting practice at Bath he added to his academic achievements by taking the M.Ch.Dublin in 1937 and being elected a Fellow of the Royal College of Surgeons of England in 1939. Harry Martin's death (writes a colleague) occurred after a short illness, during which his calm courage amazed his closest friends; he was still a scientific observer even when he himself was the patient. As a surgeon he was an accomplished operator whose technique was as artistic as it was careful, and no detail was too small for attention. His patients gave him their confidence and gratitude, and to his colleagues he gave advice based on sound judgment; he was possessed of those two great assets of a surgeon—humility and courage. His death leaves a gap in the ranks of the younger surgeons who have the progress of surgery at heart. We have lost a delightful friend, and his hospital a loyal and enthusiastic member of its staff. He married in 1939 Phyllis, daughter of Dr. J. W. Fordham of Leicester, to whom our sympathy goes out in her irreparable loss.

We regret to announce that Dr. JAMES BUCHANAN of Watford died on Dec. 17 at Omagh, Co. Tyrone, in his 79th year. He studied medicine at Belfast and at University College, London, and graduated M.B., M.S. of the old Royal University of Ireland in 1888, after winning scholarships in anatomy and physiology at Queen's College, Belfast. Dr. Buchanan had been assistant school medical officer under the Herts County Council and medical officer to the Watford Infirmary; he was also for some years M.O.H. at Old Calabar, West Africa. He joined the B.M.A. as long ago as 1889 and held office as chairman to the Watford Division in 1935-6.

We regret to announce the death, suddenly, on Dec. 23, 1942, of Dr. C. E. POTTER of Derby. Although he had been in indifferent health for several years he had continued to work, and the end came unexpectedly. Born in Glasgow in 1872, Charles Edward Potter was educated at Bradford Grammar School and at Oliver's Mount, Scarborough. After leaving school he was a "pupil-learner" with a doctor near Durham, and there, at the age of 18, he was first introduced to midwifery when he was called into a house he was passing to assist at a birth. He entered Edinburgh University in 1890, graduating M.B., C.M. in 1894. He studied obstetrics in Dublin, and was for a short time at the Seamen's Hospital, Greenwich. In 1896 he went to Derbyshire as assistant to Dr. Harvey in Wirksworth, and later began general practice in the country district of Parwich, near Ashbourne, where he was also medical officer of health. In 1901 he obtained the Edinburgh M.D., and the following year took over the practice of his brother-in-law in Derby, which he carried on for over 40 years. During most of his professional life Dr. Potter was honorary obstetric physician to the Nightingale Maternity Home, to which he also devoted much time as a member of the board of management. He was an active supporter of the B.M.A., being chairman of the Derby Division in 1925; he was representative on the Maternity and Child Welfare Committee in 1923, and a member of the local executive committee for more than 20 years. That he had the confidence of his colleagues is shown by the fact that he sat on the local emergency committee in the last war and was a member of the Local Medical War Committee at his death. He did not seek office, although he was much valued for his wisdom and common sense. He was secretary to the Derby Medical Society for five years, was a regular attender, and had a successful year of office when his turn came round to be president. He was an active member, one-time secretary, of the Local Panel Committee. He leaves a gap in the local profession which it will be difficult to fill.

We announce with regret the death on Dec. 24 of Lady Cheatle, wife of Sir G. Lenthal Cheatle. She was President of the Ladies' Guild of the Royal Medical Benevolent Fund from March, 1930, to March, 1940. Lady Cheatle combined in an extraordinary degree a very warm and sympathetic nature with a practical and clear-sighted outlook on life. Her advice, often sought and never in vain, was invaluable on any difficult problem. The work of helping the destitute widows and children of medical men was always in the forefront of her life, and she never lost sight of its human element. She took the sorrows of others much to heart, and a beneficiary was to her an individual, never a "case." Her charming, gracious personality and her many little acts of kindness will not easily be forgotten.

We regret to announce the death, at the age of 88, of Dr. FRANK JAMES ALLEN at Letchworth on Dec. 28. He was born at Shepton Mallet on April 17, 1854, and was educated at Taunton School and St. John's College, Cambridge, of which college he was a Fellow, graduating B.A. (being placed in the First Class of the Natural Sciences Tripos) in 1878. He proceeded M.A. in 1882 and in the same year took the M.R.C.S. In 1883 he obtained the L.R.C.P. and two years later the M.B., proceeding M.D. in 1895. From 1887 to 1899 he was professor of physiology at Mason University College, Birmingham. He returned to Cambridge in 1902 and devoted himself to antiquarian and archaeological pursuits, being honorary secretary of the Cambridge Antiquarian Society from 1913 to 1930. In 1932 his book *The Great Church Towers of England* was published by the Cambridge University Press. It was the life-work of his leisure hours and was illustrated almost entirely by his own photographs. He was also deeply interested in music and wrote and published songs, nursery rhymes, and hymn tunes. He returned to Shepton Mallet in 1931 and was active in the Somerset Archaeological Society, particularly in connexion with church architecture. He was recently described by the Bishop of Bath and Wells as "the greatest living authority on church towers." He retired to Letchworth in 1940. Dr. Allen had been a member of the B.M.A. since 1887.

We regret to announce the death at sea by enemy action last autumn of Dr. GEOFFREY CHARLES PURSLOW, son of the late Lieut. George Purslow, who was killed in action in October, 1918, and of Mrs. Mabel Gwynne of Leek, Staffs. He was born on Jan. 19, 1916, and was educated at the University of Birmingham, graduating M.B., Ch.B. in 1940, also taking the M.R.C.S., L.R.C.P. in the following year. After qualifying he was employed as ship surgeon with various steamship companies, and it was while on a voyage in this capacity that he lost his life, his ship being torpedoed on or about Sept. 17. He was a member of the B.M.A.

The death took place recently in Melbourne of Dr. GREGORY SPROTT, for many years medical officer of health of Hobart, Tasmania. Dr. Sprott was born in Scotland 80 years ago, and received his medical training at Glasgow, where he qualified in 1885, took the D.P.H. in 1888, and the M.D. in 1894. For a time he practised in the North of England, and then, going out to Tasmania, became part-time medical officer of health for Hobart from 1896 until 1903, and again from 1907 to 1923, and for the following 10 years he served the city in a full-time capacity. He was a man of great reforming zeal, and it was very largely owing to his efforts that an underground system of sewerage was provided for Hobart. He pressed forward the scheme in the face of much criticism, and his administration in this and other respects was greatly to the advantage of the city. It was said of him by one of the city's officers that just as Augustus found Rome brick and left it marble, so Dr. Sprott found Hobart "a stinking cesspit" and left it a clean and healthy city. He also took an active missionary part in urging upon Tasmania the need for vaccination, and through his efforts a Health Act was passed, the most important section in which requires the appointment of a chief health officer who must hold not only a medical degree but the D.P.H. He was mainly responsible for the establishment of the Vaucluse Infectious Diseases Hospital, of which he was medical superintendent, and for many years he was honorary surgeon to the Hobart General Hospital and the Queen Alexandra Hospital. He showed great interest in the work of the St. John Ambulance Association and organized the excellent ambulance service in Southern Tasmania. Dr. Sprott was well known in this country as one of the oversea representatives at the Annual Meetings in 1912, 1920, 1926, and 1934. He was a member of the Central Council and of the Dominions Committee in 1920-1. He was an active member of the Federal Council of the British Medical Association in Australia, a director of the Australian Medical Publishing Company, and a leading spirit in successive Australasian Medical Congresses.

The death of Dr. LEWES NICHOLAS GIBBES of Church Street, Kensington, where he had practised for more than forty years, removes perhaps the doyen of the general practitioners of that locality. After study at the medical school of St. George's Hospital, he qualified M.R.C.S., L.R.C.P. in 1895. He had been surgeon to the Crippled Boys Home, long established at Wrights Lane, Kensington, and dermatologist to the Princess Louise Hospital for Children in North Kensington. He had formerly acted in temporary capacities at the Golden Square Throat Hospital and at St. George's Hospital; he had also held an appointment as anaesthetist to the King George Hospital. From this record it follows that he was a general practitioner in the real sense of the term, adept in many branches of the medical art.

Medico-Legal

MISUSE OF MEDICAL TITLE

The magistrates of North Shields recently convicted Charles Bernard Clark on charges of unlawfully, wilfully, and falsely using the descriptions doctor of medicine, bachelor of science, and specialist in incurable diseases, thereby implying that he was registered under the Medical Act, 1858. Clark pleaded guilty, and another charge of describing himself as a pathologist was dropped. Evidence was given that he had put up a board at a house in North Shields, displaying his name together with these descriptions and his consulting hours. This board actually deceived a number of persons and made them believe that he was a registered medical practitioner. A married couple who attended him concluded from his condemnation of medical practitioners and hospitals that he was not registered, and consulted their own doctor. Clark sent in a bill, on a form containing the titles which appeared on the board, for a substantial sum. The matter was reported to the London and Counties Medical Protection Society, who prosecuted. Clark was also shown to have been sentenced at Liverpool some years earlier to three years' imprisonment for false pretences. A police sergeant said that no later complaint had been made about him to the police, and some of his treatment had apparently given excellent results. His solicitor said that he had been born in Jamaica and had obtained a degree of B.Sc. at the Cornwall College there. He had been in England for seven years and had acquired some medical knowledge as a private in the R.A.M.C. He had believed mistakenly that he was entitled to practise, and had applied to the Central Medical War Committee of the B.M.A. From a letter written by the Committee he had wrongly understood that he could use the word "pathologist" without being registered. He undertook not to use the titles again. The court fined him £15 on each charge and ordered him to pay 8 guineas towards the legal costs and the expenses of bringing a police witness from Liverpool.

Universities and Colleges

UNIVERSITY OF LONDON

Owing to the date on which Easter falls this year the M.B., B.S. examination will start on Tuesday, April 27, instead of on Monday, April 19.

By a printer's error the name of B. P. Webber was printed as B. P. Webster in the University of Cambridge Final M.B. (Part I) pass list published in this column on Jan. 2 (p. 27).

REHABILITATION IN SCOTLAND

A year ago we announced (Jan. 31, 1942, p. 161) that the Department of Health for Scotland had decided to extend its scheme whereby civilian patients were admitted to emergency hospitals, thus helping to reduce the numbers on the waiting lists of voluntary hospitals. At a Press conference recently Dr. Andrew Davidson, C.M.O. of the Department, gave figures showing how successful this scheme had been. Some 10,000 patients, he said—8,000 in the last year—had been taken off the waiting lists of voluntary hospitals in Scotland. Medical and surgical cases alike had been admitted, but not chronic cases, as the beds had to be readily available, should the need arise, for war casualties. Most of the voluntary hospitals had co-operated, but a few, surprisingly, did not support the scheme. The Department made no charge to the patients but received from the voluntary hospital a fixed sum for each person admitted. Dr. Davidson also referred to the success of the Clyde Basin experiment, under which treatment is provided free for industrial workers suffering strain, and men invalided out of the Services are restored to working capacity and to their old jobs in the shortest possible time. Some 1,600 industrial workers have received treatment since the scheme started and they are now being dealt with at the rate of 100 a week. Since Dr. Davidson's conference, when he indicated that there was a proposal to open "fitness centres," the Department of Health has announced that Gleneagles Hotel, which was taken over at the outbreak of war as an emergency hospital, is to be a special rehabilitation or fitness centre for Scottish miners, the first of whom are expected to arrive about Jan. 11. It will accommodate about 200 patients, and has facilities for physiotherapy, occupational therapy, remedial exercises, and physical instruction, as well as entertainment and welfare activities. No charge is to be made for treatment, and the Miners Welfare Commission will pay the patient's travelling expenses. Treatment will last about six weeks, and will be available for miners with disabilities following injuries, for those convalescing after illness, and men suffering from rheumatic conditions.

Medical News

A whole-day conference of the Nutrition Society will be held at the London School of Hygiene, Keppel Street, London, W.C.1, on Saturday, Feb. 6, beginning at 11 a.m., to discuss "Nutrition in Pregnancy." Papers will be read by Mr. Aleck Bourne (Foetal Development), Dr. J. Hammond (Physiological Factors Influencing Birth-weight), Sir Joseph Barcroft (Nutritional Functions of the Placenta), Prof. A. St. G. Huggett and Dr. Margaret Balfour (Diet of the Pregnant Woman), Mr. R. M. Titmuss (Stillbirth and Neonatal Mortality). The chair will be taken in the morning by Dr. F. H. A. Marshall, and in the afternoon by Brigadier F. A. E. Crew. A subsequent meeting will be held on "Nutrition in Infancy." Further details of the Nutrition Society can be had from the Hon. Sec., Dr. Leslie Harris, Nutritional Laboratory, Milton Road, Cambridge.

"Space and Time in Modern Physics" will be the subject of a lecture by Prof. H. Dingle (Professor of Natural Philosophy at the Imperial College of Science) to be delivered at the British Institute of Philosophy, University Hall, 14, Gordon Square, London, W.C.1, on Friday, Jan. 22, at 4 p.m.

A meeting of the Middlesex County Medical Society will be held at the Central Middlesex County Hospital, Acton Lane, N.W., on Thursday, Jan. 21, at 3 p.m., when Mr. T. G. Illtyd James will speak on "Methods in the Diagnosis of Cerebral Tumours" and Dr. J. Sakula will discuss "A Recent Outbreak of Gastro-enteritis in the Newborn." Visitors, especially members of the American and Canadian Forces at present in this country, will be welcome.

A course of lectures on Social Medicine and Public Health, arranged by the Socialist Medical Association, will be given at the Conway Hall, Red Lion Square, W.C.1, on successive Thursdays at 5.30 p.m., as follows: Jan. 21, Environmental Factors in Disease, Mr. F. Le Gros Clark; Jan. 28, Mother and Child, Mr. Aleck Bourne; Feb. 4, Statistics of Occupational Mortality, Prof. J. B. S. Haldane; Feb. 11, Health of the Industrial Worker, Dr. T. O. Garland; Feb. 15, Social and Economic Aspects of Tb., Dr. Brian Thompson; Feb. 25, V.D. as a Social Problem, Dr. Joan Malleson; and March 4, Social Insurance, Prof. Hermann Levy. Tickets, 1s. for each lecture or 5s. for the series, may be obtained from Dr. L. T. Hilliard, Fountain Hospital, S.W.17.

The clinical teaching of medical students is referred to in the latest report of the Birmingham United Hospital. The city authorities were asked whether, in the event of Queen Elizabeth Hospital being seriously damaged, students might continue jointly their work at one or more of the municipal hospitals. The reply was that arrangements could be approved for the continuance at municipal hospitals of medical students, but not for the attendance of their clinical professors, teachers, and tutors. Meanwhile a generous offer by the Wolverhampton Royal Hospital of full co-operation and accommodation for students and teachers has been gratefully accepted.

It is 50 years since the Glasgow Royal Infirmary School for Nurses was opened, and to mark the occasion and to commemorate the work of Sir William Macewen and Mrs. Strong in connexion with it, one of the managers of the hospital has presented two medals to be competed for annually: one, the Macewen medal, to be awarded to the best surgical nurse, and the other, the Mrs. Strong medal, to the best medical nurse. Mrs. Strong, now in her nineties, was a pupil of Florence Nightingale.

The range of British Standards is so varied and the number of war issues so large that no printed list can be up to date, but the latest information about new and revised standards, of which there are at present over 1,000, can be obtained from the B.S.I. Library at 28, Victoria Street, Westminster. These standards may be studied in the library between 10 a.m. and 5 p.m., Monday to Friday, and at other times by appointment.

Under a new Order (S.R. & O., 1942, No. 2668), which came into force on Jan. 5, quinine and its salts may not be prescribed except as anti-malarial drugs, although quinidine may still be prescribed for cardiac arrhythmia. No person may "acquire, treat, use or consume" cinchona, cinchona products, or synthetic substitutes except under licence from the Ministry of Supply. Stocks equivalent to more than 16 oz. of quinine must be declared to the Director of Medical Supplies, Portland House, Tothill Street, London, S.W.1.

The Service Libraries and Books Fund are appealing for more books and magazines for the Forces. Although the number already distributed since the beginning of the war—some 14,000,000—may seem large, the life of reading matter with the Forces is very short. The need, therefore, is for continuous help from the public, not just sporadic donations of books and magazines. They can be handed in at a post office and need not be wrapped or addressed.

The curator of the laboratory of the Royal College of Physicians of Edinburgh, Dr. Fergus Hewat, reports that the research and routine services were fully maintained during 1941. In the research department cancer diagnosis has long been the special task of the laboratory. Other directions of activity are postgraduate laboratory instruction and direct and visiting consultation with practitioner and patient. It is mentioned that most of the post-war planning for medical laboratories makes reference to centralization of technical examination, of which the laboratory at Edinburgh has been, perhaps, a pioneer example in the British Isles. Complete examinations comprised under histology, haematology, bacteriology, and biochemistry are carried out under unified direction.

At the request of the Czechoslovak Government arrangements have been made for a unit of 60 beds for Service and civilian patients of Czechoslovak nationality to be established at Hammersmith Hospital (L.C.C.). The medical and clerical staff required in addition to the normal establishment will be provided and paid for by the Czechoslovak authorities, but all nursing and domestic staff will be engaged and paid by the L.C.C. The new unit will be regarded as an integral part of the whole hospital, and the medical superintendent will be in general administrative control.

The National Science Fund of the National Academy of Sciences announces two prizes of $2,000 each, to be known as the Charles L. Mayer Awards, to be given for outstanding contributions published in 1942 and 1943 respectively "to our knowledge of factors affecting the growth of animal cells, with particular reference to human cancer." To assist the fund in the administration of the awards a special advisory committee has been appointed, and this committee will welcome suggestions on outstanding contributions published in 1942. The address of the National Science Fund is 515, Madison Avenue, New York City.

Since the beginning of the war £100,000 has been raised—almost half of it during the year 1942—for hospital and ancillary services under the auspices of the Bristol Hospitals Fund. The Fund was inaugurated in July, 1939, and represents the co-ordination and extension of contributory schemes which had been running in connexion with the Bristol hospitals. It has been made the central contributory scheme of the six voluntary hospitals of Bristol—the Royal Infirmary, the General Hospital, the Royal Hospital for Sick Children and Women, the Eye Hospital, the Homoeopathic Hospital, and the Cossham Memorial Hospital.

A fund has been started in this country for a memorial hospital in Abyssinia to Princess Tsahai, who took up nursing while an exile here and died as she was about to put her training into practice in her native country. It is proposed to have medical and nursing staff attached to the hospital, to prepare Ethiopians to work in their own institutions, also a research unit, a library, and a service to treat out-patients in the villages. Donations to the Fund should be sent to Miss Isabel Fry, Church Farm, Buckland, near Aylesbury, Bucks.

The Central Council for Health Education, Tavistock House, Tavistock Place, London, W.C.1, appeals to medical practitioners with a flair for teaching to undertake to give occasional lectures in their own localities on health subjects, including venereal diseases. An adequate allowance will be made to meet all expenses. The Central Council for Health Education has been made responsible by the Ministry of Health for the central provision of health education throughout England and Wales, and it is much hoped that public-spirited doctors will help it in its important task of instructing the public on matters of health and hygiene.

The following medical promotions in and appointments to the Venerable Order of the Hospital of St. John of Jerusalem have been announced: as Knight, Dr. W. H. Kauntze, C.M.G., M.B.E.; as Commander (Brother), Col. J. L. Hamilton, *M.C.*, T.D.; as Officers (Brothers), Dr. A. Johnston, Col. G. C. Kenning, R.C.A.M.C., Col. J. B. Hance, C.I.E., O.B.E., I.M.S., Capt. J. Pirie, Dr. J. Lamberton, Lieut.-Col. C. W. Eames, D.S.O., T.D., Dr. E. H. Shaw, Major F. T. Deatker, O.B.E., I.M.S., Dr. E. S. Bowes, Brig. H. E. Shortt, C.I.E., O.B.E., I.M.S., Col. W. C. Spackman, I.M.S., Col. J. P. Huban, O.B.E., I.M.S., Lieut.-Col. J. C. Pyper, O.B.E., I.M.S.; as Associate Officers (Brothers), Dr. P. Ellman, Dr. P. C. Roy; as Officer (Sister), Dr. Frances C. B. McKay; as Serving Brothers, Dr. J. C. D. Carothers, Dr. W. L. Ingham, Dr. P. L. Regan, Dr. D. Grieve, Dr. A. M. Pollock, Dr. R. G. Tame, Dr. C. H. Smith, Dr. P. S. Martin, *M.C.*, Dr. J. T. Whitley, Dr. J. Ewing, Dr. W. D. Neill, Dr. G. M. Stoker, Lieut.-Col. S. Hunt, Dr. W. A. Ogilvy, Capt. M. A. Watson, R.A.M.C., Dr. J. Brown, Mr. E. Pearson, Col. J. E. Rusby, *M.C.*, Dr. J. A. E. M. Hadley, Dr. M. C. Lavin, Capt. P. M. Gettleson, R.A.M.C., Dr. J. Manuel, Dr. F. T. Simpson, *M.C.*, Dr. E. Haworth; as Associate Serving Brothers, Dr. M. N. Oster, Dr. B. Narayana, Dr. J. M. Rakshit, M.B.E., Dr. S. C. Datta, Dr. P. N. Kapur, Dr. R. C. Mahajan, Dr. M. M-ud-D. Chughtai; as Serving Sisters, Dr. May Rutledge, Dr. Margaret J. Trotter, Dr. Harriet R. L. Reid.

The Medical Society of Pernambuco, Brazil, has recently celebrated the centenary of its foundation.

Dr. Bernard Moiser's years of work for the relief of lepers in Rhodesia have been recognized by the award of the O.B.E. in the New Year Honours list. In his official capacity to the Government of Southern Rhodesia Dr. Moiser supervises the leper settlement at Morgenster in the Victoria District, which, under his expert direction, grows its own crops and keeps its own cattle. He was Assistant Director of Medical Services in Nigeria before he was appointed to Rhodesia, and is an old student of Guy's and University College Hospitals.

There is only one woman doctor of medicine in Peru, Dr. Mercedes Cisneros, who practises in Lima, whereas in Chile there is an Asociación Médica Feminina with 300 members.

Large quantities of serum, including anti-gas-gangrene and dysentery serums, will shortly be sent by air to Russia from the South African Institute for Medical Research in Johannesburg.

The Minister of Health has appointed Col. Frank Medlicott to be his Parliamentary Private Secretary in succession to Mr. N. A. Beechman.

According to a statement in the Press, Mr. Cleveland Fyfe, Secretary of the National Farmers' Union, recently told a meeting of Cheshire farmers that the Union "would resolutely fight compulsory pasteurization of milk."

Prof. A. T. Jurasz, Dean of the Polish Medical Faculty in the University of Edinburgh, cabling from the United States, announces that the Rockefeller Foundation has given $75,000 to buy medical instruments and equipment for the Polish Medical School.

Dr. James F. Ballard, director of the Boston Medical Library, completed fifty years of service on October 23.

Dr. John Harral Hudson of the Colonial Medical Service is reported to be missing in Malaya.

EPIDEMIOLOGICAL NOTES

Discussion of Table

In *England and Wales* the heavy fall in the notifications of infectious diseases that was reported can be partly accounted for by the Christmas week-end. The decreases recorded were for measles 2,394, scarlet fever 566, acute pneumonia 332, whooping-cough 323, diphtheria 277, cerebrospinal fever 32, dysentery 10.

The largest declines in the notifications of scarlet fever were for Lancashire 104, London 78, Yorks West Riding 76, Staffordshire 74, Middlesex 54. The greatest variations in the incidence of diphtheria were in Yorks West Riding, Durham, and Lancashire, where 59, 40, and 28 fewer cases were recorded. The only changes of note in the county totals of whooping-cough were decreases in Yorks West Riding of 45 and in London of 30.

The fall in the notifications of measles was general throughout the country, and only a few counties failed to register a decline, the only exceptions of note being Sussex and Bedfordshire with rises of 45 and 33. The largest declines were those of Yorks West Riding 459, Lancashire 274, Staffordshire 221, Nottinghamshire 201, London 198, Derbyshire 186, Wales 184, Leicestershire 183, Durham 179.

A general fall in the notifications of dysentery was recorded, and only in Surrey was there an appreciable rise from 3 to 16. The other chief centres of infection were Lancashire 20, London 15, and Essex 9. Only 5 cases were reported from Middlesbrough C.B., the lowest weekly total since the outbreak began fifteen weeks ago.

In *Scotland* a general fall was reported in the incidence of infectious diseases, especially measles, of which 237 fewer cases were recorded than in the preceding week. The largest of the local declines were Glasgow 61 and Dundee 58. In Glasgow 104 cases of scarlet fever were notified, an increase of 12.

In *Eire* the outbreak of poliomyelitis persists, and 10 cases from nine areas were reported during the week.

Small-pox

The risk of small-pox spreading in Edinburgh is now considered to be over. The ban imposed on Nov. 13 on visitors to the municipal hospitals was lifted on Jan. 4. The outbreak, which began on Nov. 1, resulted in 36 cases, 12 of which are still in hospital, and 8 deaths. In Edinburgh approximately 274,000 vaccinations were performed—about 64% of the population.

Returns for the Week Ending January 2

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 2,159, whooping-cough 1,187, diphtheria 939, measles 14,989, acute pneumonia 936, cerebrospinal fever 95, dysentery 95, paratyphoid 7, typhoid 6. One case of small-pox was notified in the rural district of Plympton St. Mary, Devonshire.

No. 51

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended Dec. 26.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for · (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1942 (a)	(b)	(c)	(d)	(e)	1941 (Corresponding Week) (a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	64	3	15	1	4	110	4	32	—	5
Deaths		1	—				—	1		
Diphtheria	731	30	244	50	32	1,006	38	310	38	29
Deaths	14	1	5	1	—	43	3	6	5	—
Dysentery	103	15	43		—	146	14	43		—
Deaths				—	—			—	—	—
Encephalitis lethargica, acute	3	—	—		—	5	—	1		—
Deaths		—					—	—		
Erysipelas		—	66	4	4		—	56	9	3
Deaths		—					—	—		
Infective enteritis or diarrhoea under 2 years				25						
Deaths	23	3	10	12	2	39	4	9	6	3
Measles	10,888	300	332	10	13	710	28	52	36	4
Deaths	16	—	3	—	—	1	—	1	1	—
Ophthalmia neonatorum	60	3	12		—	65	2	15		1
Deaths										
Paratyphoid fever	3	2				19	3	9	—	
Deaths	—	—				—	—	—	—	
Pneumonia, influenzal*	671	48	7	7	3	903	51	8	2	7
Deaths (from influenza)	38	5	1	—	1	33	4	4	—	—
Pneumonia, primary			227	6		—		216	8	
Deaths				9	10		34		9	8
Polio-encephalitis, acute	—	—				2	—			
Deaths		—					—			
Poliomyelitis, acute	7	1	3	10	—	11	—	1	7	—
Deaths							—	—		
Puerperal fever	—	—	12	—	—	—	2	10	2	—
Deaths		—					2			
Puerperal pyrexia	111	7	17		2	170	8	11		1
Deaths										
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	2,054	98	372	41	51	1,220	35	252	48	26
Deaths	4	1	—	—	—	1	—	—	—	—
Small-pox	—	—	1		—	—	—	—		—
Deaths		—		—	—		—	—	—	—
Typhoid fever†	6	1				22	—	2	8	—
Deaths	1	—				1	—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths			—	—	—			—	—	—
Whooping-cough	837	51	29	47	7	1,564	220	62	31	9
Deaths	8	1	—	1	—	15	5	—	—	—
Deaths (0–1 year)	276	36	61	37	10	402	34	81	26	14
Infant mortality rate (per 1,000 live births)										
Deaths (excluding stillbirths)	3,776	503	560	142	104	4,483	589	620	187	112
Annual death rate (per 1,000 persons living)			12·6	9·5	‡			13·5	12·4	‡
Live births	4,320	547	720	187		4,830	428	792	333	228
Annual rate per 1,000 persons living			14·9	12·5	‡			16·1	22·1	‡
Stillbirths	185	24	41			175	16	29		
Rate per 1,000 total births (including stillborn)			54					35		

* Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

† Includes paratyphoid A and B for Northern Ireland.

‡ Owing to evacuation schemes and other movements of population, birth and death rates for Northern Ireland are no longer available.

The Services

The D.S.C. has been awarded to Temp. Surg. Lieuts. J. I. A. Jamieson, G. C. McKinlay, and I. Miskelly, R.N.V.R., and to Temp. Surg. Lieut. J. C. Gray, R.C.N.V.R.

The M.C. has been awarded to Capts. J. C. Bishop, M. C. Fulton, A. R. Wilson, and J. W. MacMillan, and Lieut. D. T. Milnes, R.A.M.C

Surg. Lieut. J. W. Wood, R.N.V.R., has been mentioned in dispatches for good services in the Mediterranean.

Temp. Surg. Lieut. E. O. Davies, R.N.V.R., has been mentioned in dispatches.

Surg. Lieut. G. A. Hendry, R.C.N.V.R., has been mentioned in dispatches (posthumous).

Squadron Leaders Agnes C. Gillan, G. B. Grayling, H. G. Magill, and J. St. C. Polson have been mentioned in dispatches by Air Officers Commanding-in-Chief, and F/O J. Dougall has been commended for brave conduct.

The King has approved the award of the R.N.V.R. Officers' Decoration to Surg. Cmdr. R. Wear and Acting Surg. Cmdrs. R. S. Allison and A. R. Thomas, R.N.V.R.

Brig. G. B. Chisholm, M.C., Director-General, Canadian Medical Services, has been appointed C.B.E. (Military Division); Lieut.-Col. M. H. Brown, R.C.A.M.C., an O.B.E. (Military Division); and Capt. (acting Major) H. E. Foex and Capt. H. C. Hair, R.C.A.M.C., M.B.E. (Military Division).

CASUALTIES IN THE MEDICAL SERVICES

Surg. Lieut. KENNETH COLE JEFFERY, R.N.V.R., is reported "missing, presumed killed" on active service. He was born on June 17, 1909, the son of the late Surg. Capt. T. W. and Mrs. Jeffery, and was educated at the University of London and at the London Hospital, graduating M.B., B.S. in 1932, also taking the M.R.C.S., L.R.C.P. in the same year. He held posts at the London Hospital and the County Mental Hospital, Maidstone, before settling in practice at Sidmouth, where he became honorary physician to the local cottage hospital. Soon after the outbreak of war he entered the R.N.V.R., and in Sept. last was awarded the D.S.C.

Col. WILLIAM BRUCE, O.B.E., R.A.M.C., died in North Africa in December, aged 55. He was the third son of the late Mr. James Bruce, W.S., of Edinburgh, and was educated at Edinburgh Academy and at the University of Edinburgh, where he graduated M.B., Ch.B. in 1911. Not long afterwards he went to live at Onehunga, New Zealand, and served in the N.Z.M.C. from 1914 to 1920, attaining the rank of major. He was appointed O.B.E. in the 1919 New Year Honours for valuable services rendered in connexion with the war. In 1920 he entered the R.A.M.C. as capt., was promoted major in 1927, and lieut.-col. in 1941. He leaves a widow.

Lieut. DUDLEY VAUGHAN PHILLIPS, R.A.M.C., who died on Jan. 4 at a battle school in Scotland as the result of an accident, was born on May 4, 1917, the son of Mr. and Mrs. Vaughan Phillips of Cyncoed, Cardiff. He was educated at the University of Cambridge, where he took the degree of M.A., and at St. Mary's Hospital, qualifying M.R.C.S., L.R.C.P. in 1942. He entered the R.A.M.C. in September last.

Prisoners of War.—Capt. A. Y. Adam, R.A.M.C., Capt. R. H. Cuthbert, R.A.M.C., Lieut.-Col. F. H. A. L. Davidson, I.M.S., Lieut. A. L. Dunlop, R.A.M.C., Capt. G. A. F. R. Gibson, R.A.M.C., Major P. R. Graves, R.A.M.C., Capt. J. K. Hewat, R.A.M.C., Capt. G. K. Marshall, R.A.M.C., Col. D. S. Middleton, R.A.M.C., Major W. J. E. Phillips, R.A.M.C., Capt. W. J. Street, R.A.M.C., Capt. K. W. Todd, R.A.M.C., Capt. R. G. B. Young, R.A.M.C.

Wounded.—Prob. Temp. Surg. Lieut. J. A. Oddie, R.N.V.R.

DEATHS IN THE SERVICES

Col. HENRY WALKER MURRAY, late R.A.M.C. (ret.), died at Tunbridge Wells on Oct. 25. He was born at Limerick on May 12, 1854, and was educated at Trinity College, Dublin, where he graduated M.B. in 1878, also taking the M.R.C.S. in 1879. Entering the Army in 1880, he became colonel in 1908, and retired in 1911. He served in the South African War from 1899 to 1902 and took part in the relief of Kimberley and in operations in the Orange Free State, including the actions of Magersfontein, Paarde Berg, Dreifontein, Poplar Grove, and Witte Bergen, receiving the Queen's medal with four clasps and the King's medal with two clasps. In the war of 1914-18 he rejoined for duty from October, 1914, and served as A.D.M.S., first at Bedford and later at Chatham.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1.

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TELEGRAPHIC ADDRESSES.—EDITOR, *Aitiology Westcent, London;* SECRETARY, *Medisecra Westcent, London.*

B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.

QUERIES AND ANSWERS

Income Tax

Dissolution of Partnership

"Alpha" writes: A and B were in partnership, practising from their respective surgeries, sharing the gross fees equally but each paying his own surgery expenses. As from April 1, 1942, the partnership was dissolved with each partner taking over his own patients and practising as from his own surgery. How should the assessment for 1942-3 be calculated?

*** It has been judicially decided that for income-tax purposes there cannot be successors of parts of a concern. In this case neither A nor B has succeeded to the practice formerly carried on by them in partnership or is engaged in *that* practice. As a result that practice must be regarded as having ceased as from March 31, 1942, and A and B are assessable for 1942-3 on the basis that they have commenced separate practices as from that date—i.e., they will be assessable on the basis of the earnings of the current year.

Hospital Appointments: Board and Lodging

K. F. holds an appointment "at a salary of £350 a year plus £100 in lieu of board and lodging." Should the £100 be included in his income-tax return and is it taxable?

*** The answer to both questions is "Yes." The amount is undoubtedly an emolument of office; the point K. F. probably has in mind is that where board and lodging are given in kind the value is not taxable on the recipient, but such cases are exceptions to the general rule.

Private Fees after Retiring from Public Appointment

"E. M. D." retired on Aug. 31, 1941, and since then his income has consisted of his pension plus "private fees for mental deficiency work." This work consists of examinations, and he is paid for it "per case." Since giving up the appointment "E. M. D." has had to renew some books and a number of old examination instruments. How should such fees be assessed and is he entitled to deduct these renewal expenses?

*** It seems clear that "E. M. D." does not hold appointments in the sense in which that test is applied in deciding whether liability falls under Schedule E, and in our opinion he is chargeable under Schedule D. Rule 3 (*h*), applying to Cases I and II, Schedule D, provides for the deduction of sums actually expended "for the supply, repairs, or alterations of . . . articles employed for the purposes of the . . . profession," and the renewal of professional books and instruments falls within that description.

Powers of Inspector of Taxes in Eire

J. C. has made returns of income for 30 years. At the request of the inspector of taxes he has employed a chartered accountant and has supplied copies of his bank accounts, etc. He has been asked to explain what he did with various sums of money, withdrawn at different times, amounting to about £1,000, but cannot now remember sufficient of the facts to do so. The inspector has now made assessments for 30 past years to bring these sums into assessment.

*** In making these assessments the inspector is acting within his legal powers, but J. C. has, of course, a right of appeal to the Commissioners and *prima facie* he would be well advised to exercise it. It is difficult to see why the inspector should be so concerned as to what was done with the money withdrawn from the bank accounts; provided J. C. can show that the amounts

paid in to the account came from sources which were either not liable to income tax or had paid income tax, there should be no ground for now claiming tax on them. As a minor point, the inspector is not entitled to demand the employment of an accountant, but that is very frequently the best course to follow in these circumstances.

LETTERS, NOTES, ETC.

Treatment of Impetigo

Dr. ARTHUR F. CHALKLEY (Caistor, Lincolnshire) writes: There has been a good deal of correspondence recently upon the treatment of impetigo contagiosa. While I was serving in the Army in 1941 I had the opportunity of trying the various forms of treatment, as I had a small hospital for skin diseases. Of late I have had such rapid results from using sulphonamide and calamine ointment that I feel I should report the fact now when so many people are working in large numbers in proximity in different parts of the country. I have used ung. hydrarg. dil., eau d'Alibour, sulphanilamide powder with Lassar's paste, sulphur in calamine, but none has brought about healing so quickly as the following, which I do not remember having seen described; I find it very satisfactory for the treatment of children. I give the mothers a few tablets of *p*-aminobenzene-sulphonamide (0.5 gramme), and instruct them to crush a tablet and shake the powder over each lesion after removing the crusts with starch poultices, and then to put a thick dab of the calamine ointment over each one. This is repeated at least twice a day and more often if any lesion becomes bare. The results are strikingly good. I have also tried covering small lesions with pieces of eldstoplast, which is fairly satisfactory.

Universal Decimal Classification

We are asked to notify readers concerned with the abstracting of scientific and technical literature, the compilation of bibliographies, or the classification of scientific documents, that the following parts of the English edition of the *Universal Decimal Classification*, all stocks of which were destroyed by enemy action, are being reprinted by the British Standards Institution with minor amendments:

Vol. 1. Part 1. General Introduction, Auxiliary Tables, and Class 0, Generalities.
Vol. 2. Part 1. Classes 51, Mathematics; 52, Astronomy; 53, Physics.
Vol. 2, Part 2. Class 54, Chemistry.
Vol. 2. Part 3. Classes 55, Geology and Geophysics; 56, Palaeontology; 57, Biology; 58, Botany; 59, Zoology.

Vol. 1, Part 1, will be published at 7s. 6d., and Vol. 2, Parts 1, 2, and 3, at 10s. per part. Owing to the restrictions imposed by the Paper Controller, the edition will be strictly limited, and the B.S.I. wishes to ascertain the probable extent of the demand for the various parts. Prospective purchasers should therefore make their requirements known as soon as possible. Orders should be addressed to the Publications Department, British Standards Institution, 28, Victoria Street, S.W.1.

"The Accurate Diagnosis of Small-pox"

Messrs. ASH AND CO. LTD. (London, S.E.1) write: In consequence of the letter by Col. S. G. S. Haughton (Dec. 19, p. 736) we have received applications for *The Accurate Diagnosis of Small-pox* by the late Dr. Wanklyn. We printed this pamphlet in 1928, and since 1931 have had but two applications for it; consequently during the paper salvage drive we destroyed the remainder we had in stock, so that we are unable to supply any of these.

Hypnosis

Dr. L. H. EUNSON (Tipton, Staffs) writes: Dr. A. Owen-Flood replies (Nov. 14, p. 596) to my comment on your leading article on hypnotism, asserting that it is evident that I have not made a deep study of the subject, and he thinks I emphasize its evils. It is evident he has not made a deep enough study of my comments to make himself sufficiently appreciative of their meaning, and by not understanding them he misinterprets them. He subsequently condemns this misinterpreted view by actively supporting the therapeutic value of hypnotism, on which I made no depreciation, and assumes some attendant evils of which I am not aware. What I did say was that there was a degree of relationship between the hypnotic state and the transference state obtained in the early stages of psycho-analysis, and I explained, by quoting Ernest Jones, that psycho-analysis proceeds to its ultimate goal via the subsequent stage of rendering transference conscious, whereas hypnosis does not do so. It is to Jones that we owe the observation that in hypnosis increased resistance to the necessary association of ideas occurs, and that psycho-analysis cannot proceed via hypnosis. I hope it is now quite clear to your correspondent that such a statement takes no exception to the therapeutic value of hypnotism in the minor maladies he quotes. I agree with his views. Like most of our eminent writers on this subject, however, he will find that if he proceeds to the treatment of the severe degrees of neurosis the results obtained are capricious and evanescent. Your correspondent's letter assures me I was correct in suggesting that more emphasis could have been given to this point, and my object in writing the letter was to obtain the viewpoint of others through the medium of your columns.

Headaches and "Silent" Sinusitis

Dr. SYDNEY PERN (Ballarat, Australia) writes: I read Dr. Craig's remarks on this subject (Aug. 22, p. 230) and it may be of interest to record my own experience. In 1925 I published a paper in the *Medical Journal of Australia* on the relationship of sinusitis to disease. I found that no less than 25% of patients attending my medical out-patient departments were suffering from sinusitis. I soon found that relying upon *x*-ray examination was of little use, but that if a patient had any creamy or yellow discharge from the nasopharynx persistently it was a definite sign of sinusitis. This in the majority of cases was accompanied by a history of morning headaches, frequent blocking of nose, and repeated colds. In chronic cases there may be only a little yellow discharge once or twice a week, which, if persistent, is still diagnostic. There are, however, some cases in which one cannot even get this history, yet other symptoms are sufficient on which to make a diagnosis. Blocked sinuses are more common than is realized, and these, as well as discharging sinuses, are responsible for far more ailments than is at present recognized. I have personally seen many cases of anxiety neurosis cured by treating the sinuses. I have seen patients sent to the mental hospitals on account of the same thing. I have cured many cases of exophthalmic goitre by clearing up sinus infections as well as chronic bronchitis and asthma in children and adults. A number of cases of retrobulbar neuritis have been cured by adequate sinus treatment. My own experience after many years has led me to believe that, of all the causes of headache, sinusitis probably accounts for 75%. Headaches due to eyestrain are usually felt in the evening, while sinus headaches are experienced on waking in the morning.

Rectal Administration of Sulphonamides

Dr. H. G. J. HERXHEIMER (Westward Ho!) writes: The use of the sulphonamides grows daily. On the other hand, if they are given orally in the proper amounts they often cause nausea and vomiting or at least total loss of appetite, even if the usual precautions (sod. bicarb. or glucose) are taken. In order to avoid this disturbing side-effect I have given these drugs during the last 2 years to more than 25 patients rectally, as a small retention enema. The procedure is simple. Four half-gramme tablets of sulphanilamide or other drugs of this group are put into 1/2 to 1 oz. of lukewarm water, where they quickly disintegrate and will form, if stirred well, a thick, milky suspension. This is injected by a short-nozzled syringe into the rectum. The patient should afterwards go into knee–elbow position for half a minute. The suspension does not irritate and is easily retained. There are no side-effects. I feel compelled to publish this note, as this mode of application seems generally unknown in spite of its simplicity. It avoids sickness and even loss of appetite, and the accuracy of the dosage will not be disturbed by vomiting. The therapeutic effect, however, is the same as if given orally, as can easily be seen from its influence on the temperature curve. Of the drugs in question, sulphathiazole and sulphapyridine give a very good suspension, whereas sulphanilamide proper—at least one well-known brand which I used—sedimentates rather quickly, and must be used immediately after the preparation of the suspension.

An Adapted Cork

Dr. J. L. BARFORD (Guildford) writes: You published on Oct. 4, 1941 (p. 480), a brief description of my device for washing contaminated eyes. Briefly, a cork has about 4 inches of soft rubber tubing of ordinary douche-can diameter passed through it eccentrically and another small hole is bored in it for the entry of air. This device can be used to great advantage also for giving sips of water to "shocked" casualties, who could easily suck a little water through the rubber tube while lying supine. Obviously it is likely to be more useful for this purpose than for washing eyes. The cork is kept in a small calico envelope attached to the water-bottle. Some difficulty may be experienced in boring the cork, and it is advisable to use a proper cork borer. The cost of the corks is about 3½d. a dozen. I am informed that Messrs. Boots have made many of these adaptations for certain local authorities.

A Disclaimer

Dr. C. G. EASTWOOD, medical officer of health for Weston-super-Mare, asks us to state that he was not responsible for the reports that appeared in the lay press of a small, crude experiment in the control of the common cold which he was conducting among members of the local municipal staff.